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AMPHIPODA

BY

K. H. BARNARD, D.Sc.

WITH TWENTY-ONE TEXT-FIGURES

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AMPHIPODA

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For the privilege of reporting on the very interesting collection of Amphipods I have to thank Lt.-Col. R. B. Seymour Sewell; and I am indebted to Dr. Isabella Gordon, of the British Museum, for supplying transcriptions and tracings from works not accessible to me.

The collection is not a very large one. It comprises 116 species, the majority of which are well known Indo-Pacific species. But there are four species whose presence in this region is most unexpected and interesting. It is curious that the collection contains very few representatives of the family Hyperiidæ, except from one station (St. 61). Seven species in the Gammaridea and one in the Caprellidea are described as new.

Historical.—The area explored by the Expedition is almost entirely unworked. Only from the periphery, west, south and east, are there any records of Amphipods. None are known from the central and northern portions of the Arabian Sea, although the R.I.M.S. "Investigator" did some dredging there. The German deep-sea vessel "Valdivia" sailed home from Zanzibar along the East African coast, but apparently collected no Gammarids, only Hyperiids.

For our knowledge of the Amphipods of the Red Sea we have the reports of Kossmann, Walker, Spandl (S.M.S. "Pola"), Cecchini, and Schellenberg (Cambridge Suez Canal Expedition); of the Seychelles, Chagos, Maldive and Laccadive area the reports of Walker (Percy Sladen Expeditions) and Chevreux (Mission de M. Alluaud); of Socotra and Abd-el-Kuri Walker and Scott's report on Dr. Forbes' collecting; and of Zanzibar the early records of Hyperiids by Claus and a later paper by Walker.

Distribution.—For each Indo-Pacific species captured by the John Murray Expedition I have thought it useful to set out in detail the localities in the Indian Ocean from which it has previously been recorded, including in this region the Red Sea, the southern portion of the Indian Ocean to about lat. 20° S., and the East Indies as far as long. 100° E.

The western Indian Ocean might perhaps be regarded as a faunal unit, a good few of whose members may extend along the east coast of Africa as far as the southern point of the continent. The fact that some of the Amphipods (and Isopods) of this fauna have been described from South Africa prior to their discovery farther north is due to the incidence of collecting and is quite accidental. Their presence in South Africa is to be

ascribed to the Mozambique-Agulhas current. As examples may be cited *Lysianassa variegata*, *Stomacontion capense*, *Ampithoë falsa*, *Podocerus palinuri* and *africanus*.

Greater interest attaches to the four deep-water species *Koroga megalops* (St. 131), *Thoriella islandica* (St. 76), *Sympleustes grandimanus* (St. 54), and *Eurythenes gryllus* (St. 170). The last-mentioned species has been found in several other parts of the world and its presence in the central Arabian Sea is not very surprising. *Koroga* has been found (two specimens only) off Alaska and Iceland. *S. grandimanus* and *Thoriella* are both North Atlantic forms. The specimen of *Thoriella* is by far the most valuable Amphipodan specimen collected by the Expedition, as only one other specimen has ever been captured.

A satisfactory explanation of the presence of these two last-mentioned Atlantic forms in deep water off the Oman coast is not easy to give. They are not the only " awkward customers " to deal with, as Lt.-Col. Seymour Sewell informs me that he has previously found two or three species of Arctic Copepods in Indian waters ; and I have recently recorded (1936, ' Rec. Indian Mus.', xxxviii, p. 157) from among the Isopods collected by the " Investigator " specimens of the North Atlantic *Æga ventrosa* from the northern part of the Arabian Sea and from near the Maldives. Is it too unreasonable to regard these deep-water forms from the Arabian Sea as relics of the Cretaceo-Tertiary Sea of Tethys ?

The two Hyperiids, *Mimonectes chevreuxi* (St. 172) and *Proscina stephenseni* (St. 131) are also noteworthy. The former has been found in the East Indies as well as in the Atlantic, but the latter has hitherto been known only from the Atlantic.

Clearly there is need of many more deep-sea expeditions.

LIST OF SPECIES COLLECTED.

Gammaridea.

Lysianassidæ :
- *Stomacontion pepinii* (Stebb.).
- *S. capense* Brnrd.
- *Amaryllis macrophthalma* Hasw.
- *Cyphocaris faurei* Brnrd.
- *C. anonyx* Boeck.
- *C. challengeri* Stebb.
- *Lysianassa cinghalensis* (Stebb.).
- *L. cœlochir* Wlkr.
- *L. variegata* (Stmpsn.).
- *Aristias* sp.
- *Eurythenes gryllus* (Licht.).
- *Microlysias indica* n. sp.
- *Koroga megalops* Holmes.
- *Thoriella islandica* Steph.

Hyperiopsidæ :
- *Hyperiopsis tridentata* n. sp.

Stegocephalidæ :
- *Parandania boecki* (Stebb.).

Ampeliscidæ :
- *Ampelisca brevicornis* (Costa).
- *A. tenuicornis* Lilj.
- *A. zamboangæ* Stebb.
- *A. cyclops* Wlkr.
- *A.* cf. *abyssicola* Stebb.
- *A.* cf. *daleyi* Giles.
- *Byblis lepta* (Giles).

Amphilochidæ :
- *Amphilochus neapolitanus* Della Valle.

Leucothoidæ :
- *Leucothoë spinicarpa* (Abildg.).
- *L. furina* (Say).
- *Leucothoëlla bannwarthi* Schell.

Stenothoidæ :
- *Stenothoë antennulariæ* Della Valle.
- *S. gallensis* Wlkr.

Colomastigidæ :
- *Colomastix pusilla* Grube.

Gammaridea (*continued*).

Acanthonotozomatidæ :
Iphimedia gladiolus n. sp.

Synopiidæ :
Synopia ultramarina Dana.

Œdicerotidæ :
Œdiceroides antennatus n. sp.
Œ. zanzibaricus n. sp.

Pleustidæ :
Sympleustes grandimanus (Chevr.).

Eusiridæ :
Eusiropsis riisei Stebb.

Gammaridæ :
Melita fresnelii (Aud.).
Mœra inæquipes (Costa).
Ceradocus rubromaculatus (Stmpsn.).
Elasmopus subcarinatus (Hasw.).
E. pectenicrus Bate.
E. erythræus (Kossm.).

Dexaminidæ :
Polycheria atolli Wlkr.

Talitridæ :
Hyale nigra (Hasw.).

Aoridæ :
Lembos podoceroides Wlkr.

Photidæ :
Photis longicaudata (B. & W.).
P. dolichommata Stebb.
Eurystheus atlanticus (Stebb.).
E. imminens Brnrd.
E. afer (Stebb.).
E. lophomeria n. sp.
Cheiriphotis megacheles (Giles).
Chevalia aviculæ Wlkr.

Ampithoidæ :
Ampithoë ramondi (Aud.).
A. falsa Brnrd.
Grubia filosa (Sav.).
Sunamphitoë orientalis (Dana).

Corophiidæ :
Ericthonius brasiliensis (Dana).
Cerapus abditus Templeton.
Siphonœcetes orientalis Wlkr.

Podoceridæ :
Podocerus palinuri Brnrd.
P. africanus Brnrd.
Lætmatophilus leptocheir n. sp.

Hyperiidea.

Lanceolidæ :
Lanceola sayana Bov.

Mimonectidæ :
Mimonectes chevreuxi (Pirlot).

Scinidæ :
Proscina stephenseni (Pirlot).
Scina crassicornis (Fabr.).
S. curvidactyla Chevr.
S. borealis (G. O. Sars).
S. marginata Bov.

Vibiliidæ :
Vibilia propinqua Stebb.
V. armata Bov.
V. pyripes Bov.

Paraphronimidæ :
Paraphronima gracilis Claus.
P. crassipes Claus.

Hyperiidæ :
Hyperia promontorii Stebb.
H. crucipes Bov.
Hyperioides longipes Chevr.

Dairellidæ :
Dairella latissima Bov.

Phronimidæ :
Phronima sedentaria (Forsk.).
P. atlantica Guér.
P. atlantica var. *solitaria* Guér.
P. colletti Bov.
Phronimella elongata (Claus).

Phrosinidæ :
Phrosina semilunata Risso.
Primno macropa Guér.
Anchylomera blossevillei M. Edw.

HYPERIIDEA (*continued*).

Pronoidæ :
Pronoë capito Guér.
Eupronoë maculata Claus.
E. armata Claus.
Parapronoë crustulum Claus.
Sympronoë parva (Claus).

Lycœidæ :
Lycœa pulex Marion.

Brachyscelidæ :
Brachyscelus globiceps Claus.
Thamneus platyrhynchus Stebb.

Oxycephalidæ :
Simorhynchotus antennarius (Claus).
Oxycephalus clausi Bov.
Streetsia challengeri Stebb.
S. porcellus (Claus).
Glossocephalus milne-edwardsi Bov.
Rhabdosoma whitei Bate.
Leptocotis tenuirostris (Claus).

Platyscelidæ :
Platyscelus ovoides (Claus).
P. armatus Stebb.
P. inermis (Claus).
Hemityphis crustulum Claus.
Tetrathyrus forcipatus Claus.
Paratyphis maculatus Claus.
P. parvus Claus.
Amphithyrus bispinosus Claus.
A. sculpturatus Claus.

Thyropidæ :
Thyropus sphæroma Claus.

CAPRELLIDEA.

Caprellidæ :
Caprella danilevskii Czern.
Paradeutella bituberculata n. sp.
Monoliropus falcimanus Mayer.
Hemiægina ? minuta Mayer.

LIST OF STATIONS AT WHICH AMPHIPODA WERE CAPTURED, WITH THE SPECIES OBTAINED AT EACH STATION.

RED SEA.

St. 5. 13.ix.33. 2 m. tow-net. 300–0 metres, oblique.
Phronima sedentaria (Forsk.), *Platyscelus inermis* (Claus).

St. 7. 16.ix.33. 2 m. plankton net. 100–0 fathoms, oblique.
Phronima sedentaria (Forsk.), *P. atlantica* var. *solitaria* Guér., *Rhabdosoma whitei* Bate.

St. 9. 17.ix.33. Otter trawl. 30 fathoms.
Leucothoë spinicarpa (Abildg.).

St. 10. 17.ix.33. Otter trawl. 30 fathoms.
Stomacontion pepinii (Stebb.), *Ampelisca zamboangæ* Stebb., *Leucothoë spinicarpa* (Abildg.), *Leucothoëlla bannwarthi* Schell., *Stenothoë gallensis* Wlkr., *Colomastix pusilla* Grube, *Melita fresnelii* (Aud.), *Mœra inæquipes* (Costa), *Ceradocus rubromaculatus* (Stmpsn.), *Eurystheus atlanticus* (Stebb.), *E. imminens* Brnrd., *Chevalia aviculæ* Wlkr.

St. B. 17.ix.33. Rectangular dredge. 16 fathoms.
Amaryllis macrophthalma Hasw., *Lysianassa cinghalensis* (Stebb.), *Ampelisca zamboangæ* Stebb., *Leucothoë spinicarpa* (Abildg.), *Elasmopus erythræus* (Kossm.), *Polycheria atolli* Wlkr., *Ericthonius brasiliensis* (Dana).

St. D. 17.ix.33. Rectangular dredge. 13 fathoms.
Mœra inœquipes (Costa).

Cape Guardafui.

St. 22. 5.x.33. From Sargassum weed caught on log-line.
Ampithoë falsa Brnrd.

St. 24. 9.x.33. Otter trawl. 60–120 fathoms.
Melita fresnelii (Aud.).

St. 27. 12.x.33. Otter trawl. 15–40 fathoms.
Lembos podoceroides Wlkr., *Photid* juv. (not identified).

Gulf of Aden.

St. 31. 13.x.33. Weed adrift on surface.
Ampithoë falsa Brnrd.

St. 39. 25.x.33. Hand-net at surface.
Glossocephalus milne-edwardsi Bov.

Kuria Muria Islands and Southern Arabian Coast.

St. 41. 27.x.33. Anchorage. Hand-net at surface.
Eurystheus atlanticus (Stebb.), *Sunamphitoë orientalis* (Dana).

St. MB II A. 28.x.33. Rectangular dredge. 5 fathoms.
Hyale nigra (Hasw.), *Eurystheus atlanticus* (Stebb.), *Grubia filosa* (Sav.), *Caprella danilevskii* Czern.

St. MB II C. 28.x.33. Rectangular dredge. 16 fathoms.
Ampelisca tenuicornis Lilj., *Lembos podoceroides* Wlkr., *Photis longicaudata* (B. & W.), *Cerapus abditus* Templeton, *Siphonœcetes orientalis* Wlkr.

St. 45. 29.x.33. Triangular dredge. 40 metres.
Amaryllis macrophthalma Hasw., *Byblis lepta* (Giles), *Amphilochus neapolitanus* Della Valle, *Leucothoë spinicarpa* (Abildg.), *Stenothoë antennulariæ* Della Valle, *Iphimedia gladiolus* n. sp., *Elasmopus subcarinatus* (Hasw.), *Lembos podoceroides* Wlkr., *Photis longicaudata* (B. & W.), *Eurystheus atlanticus* (Stebb.), *Chevalia aviculæ* Wlkr., *Ericthonius brasiliensis* (Dana), *Cerapus abditus* Templeton, *Podocerus palinuri* Brnrd., *Lætmatophilus leptocheir* n. sp., *Paradeutella bituberculata* n. sp., *Monoliropus falcimanus* Mayer.

St. Extra. 1.xi.33. Shore collecting, southern Arabian coast. On Sargassum weed.
Stomacontion capense Brnrd., *Ampelisca tenuicornis* Lilj., *Hyale nigra* (Hasw.), *Ampithoë ramondi* (Aud.), *Ericthonius brasiliensis* (Dana), *Podocerus africanus* Brnrd., *Hemiægina ? minuta* Mayer.

St. 53. 2.xi.33. Triangular dredge. 13½ metres.
Microlysias indica n. sp., *Leucothoë furina* (Sav.), *Mœra inæquipes* (Costa), *Elasmopus pectenicrus* Bate, *E. erythræus* (Kossm.), *Photis dolichommata* Stebb., *Eurystheus lophomeria* n. sp., *Cheiriphotis megacheles* (Giles), *Ericthonius brasiliensis* (Dana), *Cerapus abditus* Templeton.

Northern Arabian Sea.

St. 54. 3.xi.33. Agassiz trawl. 952 metres.
Sympleustes (*Dautzenbergia*) *grandimanus* (Chevr.).

St. 61. 8.xi.33. Day. 1 m. tow-net. 570 metres wire out.
Vibilia pyripes Bov., *Phronima atlantica* Guér., *Rhabdosoma whitei* Bate.

St. 61. 8.xi.33. Day. 1 m. tow-net. 1136 metres wire out.
Vibilia pyripes Bov., *Brachyscelus globiceps* Claus, *Streetsia challengeri* Stebb.

St. 61. 8.xi.33. Day. 1 m. tow-net. 1702 metres wire out.
Cyphocaris faurei Brnrd., *Hyperiopsis tridentata* n. sp., *Lanceola sayana* Bov., *Vibilia armata* Bov., *V. pyripes* Bov., *Phronima atlantica* var. *solitaria* Guér., *Phronimella elongata* (Claus), *Streetsia challengeri* Stebb.

St. 61. 8.xi.33. Day. 2 m. tow-net. 2265 metres wire out.
Phronima sedentaria (Forsk.), *Streetsia challengeri* Stebb.

St. 61. 8–9.xi.33. 50 cm. tow-net, surface.
Synopia ultramarina Dana, *Hyperia promontorii* Stebb., *Phronima colletti* Bov., *Phronimella elongata* (Claus), *Anchylomera blossevillei* M. Edw., *Lycœa pulex* Marion, *Brachyscelus globiceps* Claus, *Thamneus platyrhynchus* Stebb., *Simorhynchotus antennarius* (Claus), *Amphithyrus bispinosus* Claus, *Thyropus sphæroma* Claus.

St. 61. 8–9.xi.33. Night. 1 m. tow-net. 1136 metres wire out.
Scina marginata Bov., *Vibilia armata* Bov., *V. pyripes* Bov., *Paraphronima gracilis* Claus, *Phronima colletti* Bov., *Phronimella elongata* (Claus), *Phrosina semilunata* Risso, *Anchylomera blossevillei* M. Edw., *Eupronoë maculata* Claus, *Sympronoë parva* (Claus), *Streetsia challengeri* Stebb., *S. porcellus* (Claus), *Leptocotis tenuirostris* (Claus), *Hemityphis crustulum* Claus.

St. 61. 8–9.xi.33. Night. 1 m. tow-net. 1702 metres wire out.
Cyphocaris faurei Brnrd., *Vibilia armata* Bov., *Phronima colletti* Bov., *Phronimella elongata* (Claus), *Phrosina semilunata* Risso, *Anchylomera blossevillei* M. Edw., *Sympronoë parva* (Claus), *Streetsia challengeri* Stebb., *S. porcellus* (Claus), *Rhabdosoma whitei* Bate, *Hemityphis crustulum* Claus, *Tetrathyrus forcipatus* Claus, *Thyropus sphæroma* Claus.

St. 61. 8–9.xi.33. Night. 1 m. tow-net. 2265 metres wire out.
Cyphocaris faurei Brnrd., *Vibilia pyripes* Bov., *Phronima sedentaria* (Forsk.), *Phrosina semilunata* Risso.

Gulf of Oman.

St. 71. 26.xi.33. Otter trawl. 106 metres.
Lysianassa cinghalensis (Stebb.).

St. 74. 27.xi.33. Petersen grab. 160 metres.
Lysianassa cœlochir (Wlkr.), *Ampelisca cyclops* Wlkr., *Byblis lepta* (Giles).

St. 76 A. 29.xi.33. 50 cm. silk net, surface.
Hyperia crucipes Bov.

St. 76 B. 29.xi.33. 1 m. tow-net. 300 metres wire out.
Rhabdosoma whitei Bate.

St. 76 B. 29.xi.33. 1 m. tow-net. 800 metres wire out.
Vibilia armata Bov.

St. 76 B. 29.xi.33. 1 m. tow-net. 1800 metres wire out.
Vibilia armata Bov., *V. pyripes* Bov.

St. 76 B. 29.xi.33. 2 m. tow-net. 2800 metres wire out.
Cyphocaris faurei Brnrd., *Thoriella islandica* Steph.

Central Arabian Sea.

St. 94. 17.xii.33. 2 m. tow-net. 1400 metres wire out.
Lanceola sayana Bov.

St. 95. 18.xii.33. 2 m. tow-net. 1400 metres wire out.
Vibilia propinqua Stebb., *Phronima sedentaria* (Forsk.).

St. 96. 19.xii.33. 1 m. tow-net. 15 metres wire out.
Oxycephalus clausi Bov.

St. 96. 19.xii.33. 2 m. tow-net. 914 metres wire out.
Lanceola sayana Bov., *Scina crassicornis* (Fabr.), *Vibilia armata* Bov., *Phronima sedentaria* (Forsk.), *Oxycephalus clausi* Bov., *Amphithyrus bispinosus* Claus.

St. 98. 22.xii.33. 2 m. tow-net. 2800 metres wire out.
Phronima sedentaria (Forsk.).

St. 101. 27.xii.33. Hand-net, surface.
Hyperia crucipes Bov., *Thamneus platyrhynchus* Stebb.

Zanzibar Area.

St. 105. 11.i.34. Agassiz trawl. 310 metres.
Ampelisca cf. *abyssicola* Stebb., *Eurystheus afer* (Stebb.).

St. 108. 13.i.34. Agassiz trawl. 802 metres.
Phronima sedentaria (Forsk.), *Platyscelus ovoides* (Claus).

St. 110. 14.i.34. Otter trawl. 333 metres.
Eurystheus afer (Stebb.).

St. 111. 14.i.34. Agassiz trawl. 50 fathoms.
Leucothoë spinicarpa (Abildg.), *Eurystheus* sp. ?

St. 112. 15.i.34. Petersen grab. 118 metres.
Lysianassa variegata (Stmpsn.), *Leucothoë spinicarpa* (Abildg.), *Melita fresnelii* (Aud.), *Eurystheus* sp. ?

St. 119. 19.i.34. Agassiz trawl. 1228 metres.
Œdiceroides antennatus n. sp., *Platyscelus ovoides* (Claus).

St. 120. 20.i.34. Agassiz trawl. 2900 metres.
Œdiceroides zanzibaricus n. sp., *Parapronoë crustulum* Claus.

St. 121. 21.i.34. Agassiz trawl. 510 fathoms.
Phronima sedentaria (Forsk.), *Platyscelus ovoides* (Claus).

St. 122. 23.i.34. Otter trawl. 762 metres.
Oxycephalus clausi Bov.

Southern Arabian Sea (Seychelles).

St. 131 A. 10–11.ii.34. Night. 2 m. tow-net. 600–0 metres vertical.
Scina crassicornis (Fabr.), *S. curvidactyla* Chevr., *Primno macropa* Guér., *Phrosina semilunata* Risso.

St. 131 D. 11.ii.34. Day. 1 m. tow-net. 500–0 metres vertical.
Phronimella elongata (Claus).

St. 131 D. 11.ii.34. Day. 1 m. tow-net. 1500–0 metres vertical.
Cyphocaris challengeri Stebb., *Koroga megalops* Holmes, *Proscina stephenseni* (Pirlot), *Paraphronima crassipes* Claus, *Phrosina semilunata* Risso, *Primno macropa* Guér.

St. 131 D. 11.ii.34. Day. 2 m. tow-net. 2500–0 metres vertical.
Phronima sedentaria (Forsk.), *Oxycephalus clausi* Bov.

Maldive Islands Area.

St. 136. 21.iii.34. Hand-net, surface.
Hyperia sp.

St. 145 C. 1.iv.34. 1 m. tow-net. 50–0 metres vertical.
Vibilia sp.

St. 145 D. 2.iv.34. 1 m. tow-net. 300–0 metres vertical.
Vibilia armata Bov., *Eupronoë armata* Claus.

Maldive Islands.

St. 157. 6.iv.34. Triangular dredge. 120 fathoms.
Aristias sp., *Ampelisca* cf. *daleyi* Giles.

Minikoi.

St. 164. 11.iv.34. Petersen grab. 210 metres.
Byblis lepta (Giles).

Central Arabian Sea.

St. 170. 27.iv.34. Agassiz trawl. 3685 metres.
Eurythenes gryllus (Licht.).

St. 172. 29.iv.34. 1 m. tow-net. 510 metres wire out.
Cyphocaris faurei Brnrd., *C. anonyx* Boeck, *Eusiropsis riisei* Stebb., *Scina curvidactyla* Chevr., *Hyperia crucipes* Bov., *Phronima sedentaria* (Forsk.), *Primno macropa* Guér., *Phrosina semilunata* Risso, *Pronoë capito* Guér., *Parapronoë crustulum* Claus, *P. clausoides* Stebb., *Brachyscelus globiceps* Claus, *Paratyphis parvus* Claus, *Amphithyrus bispinosus* Claus.

St. 172. 29.iv.34. 1 m. tow-net. 820 metres wire out.
Paraphronima crassipes Claus, *Parapronoë crustulum* Claus, *Brachyscelus globiceps* Claus, *Streetsia challengeri* Stebb.

St. 172. 29.iv.34. 1 m. tow-net. 1500 metres wire out.
Mimonectes chevreuxi (Pirlot), *Phrosina semilunata* Risso, *Oxycephalus clausi* Bov., *Platyscelus armatus* Stebb.

St. 172. 29.iv.34. 2 m. tow-net. 2665 metres wire out.
Parandania boecki (Stebb.), *Phronima sedentaria* (Forsk.), *Phrosina semilunata* Risso, *Parapronoë crustulum* Claus, *Oxycephalus clausi* Bov.

Gulf of Aden.

St. 179 A. 2.v.34. Grab. 310 metres.
Ampelisca brevicornis (Costa).

St. 184. 4.v.34. Agassiz trawl. 1270 metres.
Phronima sedentaria (Forsk.).

St. 186. 5.v.34. 1 m. tow-net. 510 metres wire out.
Paraphronima crassipes Claus, *Eupronoë maculata* Claus, *Sympronoë parva* (Claus), *Streetsia challengeri* Stebb., *Paratyphis maculatus* Claus, *Amphithyrus bispinosus* Claus.

St. 186. 5.v.34. 1 m. tow-net. 880 metres wire out.
Scina curvidactyla Chevr., *Phronima sedentaria* (Forsk.).

St. 186. 5.v.34. 1 m. tow-net. 1150 metres wire out.
Scina borealis (Sars), *Hyperioides longipes* Chevr., *Dairella latissima* Bov., *Phronima colletti* Bov., *Brachyscelus globiceps* Claus, *Leptocotis tenuirostris* (Claus).

St. 186. 5.v.34. 2 m. tow-net. 1500 metres wire out.
Phronima sedentaria (Forsk.), *Eupronoë maculata* Claus, *Rhabdosoma whitei* Bate.

SYSTEMATIC ACCOUNT.

GAMMARIDEA.

Family Lysianassidæ.

Gen. *Stomacontion* Stebb.

Stebbing, 1906, p. 16.
Barnard, 1916, p. 109, and 1932, p. 33.

Stomacontion pepinii (Stebb.).

Stebbing, 1888, p. 716, pl. 32, and p. 720, pl. 33 (*kergueleni*).
,, 1906, p. 16.

Occurrence :

St. 10. Red Sea. 1 specimen 4 mm.

Remarks.—It is perhaps rather surprising to find this species in the Red Sea, but a comparison with Stebbing's pl. 32 (*pepinii*) discloses no differences.

Distribution.—Kerguelen, 28 fathoms.

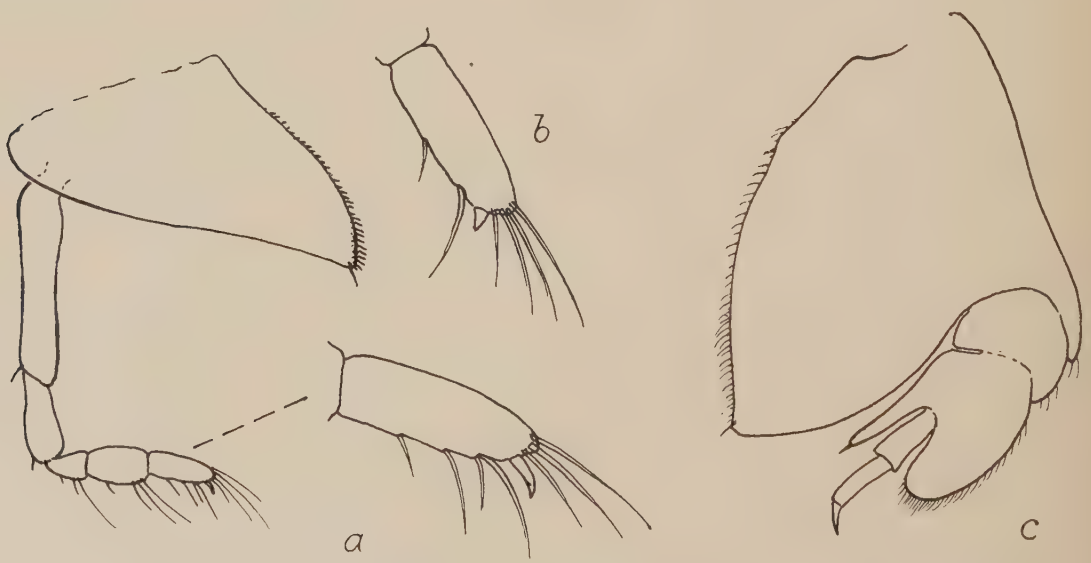
Stomacontion capense Brnrd. (Text-fig. 1.)

Barnard, 1916, p. 109, pl. 28, figs. 27, 28.

Occurrence :

St. Extra. Southern Arabian coast. 2 ♂♂ 2 mm.

Remarks.—Comparison with the type shows these specimens to be in essential agreement, but the following additional features may be mentioned as separating this species from *pepinii*.



Text-fig. 1.—*Stomacontion capense* Brnrd. *a*, Side-plate 1 and gnathopod 1, with apex further enlarged. *b*, Apex of gnathopod 1. *c*, Peræopod 5. (*a*, From the type, S. Africa ; *b*, *c*, from John Murray Expedition.)

Lower margins of side-plates 2 and 3, and to a lesser extent also 4, minutely nodulose, giving an undulate appearance (very obscure in the Cape specimen). Gnathopod 1, 2nd joint shorter and 3rd joint longer than in *pepinii*, the 3rd joint continuing the line of the 2nd, the bend in the limb occurring at the junction of 3rd and 4th joints (both the present specimens and the Cape one are preserved with the limb in this flexed position); 6th joint more slender, but very little longer, than the 5th (not considerably longer as in *pepinii*); dactylus greatly reduced, more so in the present specimens than in the type. Peræopod 5, 2nd joint differing in shape from that of *pepinii*, triangular, the anterior margin nearly straight; 4th joint with the posterior process very slender, almost spiniform, the anterior strongly convex; 5th–7th joints more slender than in *pepinii*.

Distribution.—False Bay, South Africa, 24 fathoms.

Gen. *Amaryllis* Hasw.

Stebbing, 1906, p. 23, and p. 717 (*Vijaya*).

Amaryllis macrophthalma Hasw.

Walker, 1904, p. 241, pl. 1, fig. 5 (*Vijaya tenuipes*).
,, 1909, p. 327.
Barnard, 1916, p. 114.
Pirlot, 1933, p. 122.

Occurrence :

St. B. Red Sea. 1 specimen 5 mm.

St. 45. Southern Arabian coast. 1 ♀ with embryos 8 mm., 1 specimen 7 mm., 2 specimens 4·5 mm.

Recorded Localities in Indian Ocean.—Ceylon and Wasin, B.E.A. (Walker).

Distribution.—East Indies; Australasia; South Africa.

Gen. *Cyphocaris* Boeck.

Schellenberg, 1926*a*, p. 202.
Barnard, 1932, p. 34.
Shoemaker, 1934 (Smithson. Misc. Coll., Washington, xcl, No. 2), p. 1.

Cyphocaris faurei Barnard.

Barnard, 1916, p. 117, pl. 26, fig. 4, and 1932, p. 36.
Schellenberg, 1926*a*, p. 215, text-figs. 2*e*, 11, 12, and pl. 5, fig. 4.
Pirlot, 1933, p. 128.

Occurrence :

St. 61 (day, 1702 metres wire out). Northern Arabian Sea. 1 specimen 14 mm.

St. 61 (night, 1702 metres wire out). 1 ♀ 15 mm., 2 juv. 5 mm.

St. 61 (night, 2265 metres wire out). 2 ♀♀ 15 and 17 mm., 1 ♀ 20 mm. with embryos 5 mm.

St. 76. Gulf of Oman. 1 ovig. ♀ 18 mm.

St. 172. Central Arabian Sea. 1 specimen about 14 mm. (head missing).

Remarks.—The hind margin of 2nd joint in peræopods 4 and 5 in the specimen from St. 61 (day) has a few strong serrations, and is strongly serrate in that from St. 172

(*cf.* Schellenberg's fig. 12); in the latter specimen the spur of peræopod 3 has one small adpressed tooth on upper margin.

DISTRIBUTION.—Atlantic; South Africa; East Indies; Eastern Pacific.

Cyphocaris anonyx Boeck.

Schellenberg, 1926*a*, p. 210, figs. 2*b*, 5*a*, *b*, and pl. 5, fig. 2.
Barnard, 1932, p. 36.
Pirlot, 1933, p. 127.

OCCURRENCE:

St. 172 (510 metres wire out). Central Arabian Sea. 1 specimen 8 mm.

RECORDED LOCALITIES IN INDIAN OCEAN.—3°–10° S. 51°–97° E. (Schellenberg).

DISTRIBUTION.—Atlantic; East Indies; Pacific.

Cyphocaris challengeri Stebb.

Walker, 1909, p. 327 (*alicei*).
Schellenberg, 1926*a*, p. 212, figs. 2*d*, 6–10, and pl. 5, fig. 3.
Barnard, 1932, p. 36.
Pirlot, 1933, p. 128.

OCCURRENCE:

St. 131 (day, 1500 metres). Southern Arabian Sea. 2 ovig. ♀♀ 10 mm., 1 immat. 7·5 mm.

RECORDED LOCALITIES IN INDIAN OCEAN.—Seychelles (Walker), 0°–4° S. 53°–98° E. (Schellenberg).

DISTRIBUTION.—Atlantic; East Indies; Pacific.

Gen. *Lysianassa* M. Edw.

Stebbing, 1906, pp. 37, 718.
Pirlot, 1936, p. 257.

Lysianassa cinghalensis (Stebb.).

Stebbing, 1897, p. 28, pl. 7A.
Walker, 1909, p. 328.

OCCURRENCE:

St. B. Red Sea. 1 ♂ 5·5 mm.

St. 71. Gulf of Oman. 1 immat. ♀ 6·5 mm.

REMARKS.—First joint of antenna 1 stout, without apical teeth. Notch on lower hind corner of side-plate 1 obsolete. Hand of gnathopod 2 as figured by Stebbing. Peræopods 1 and 2 not so slender as represented in Stebbing's figures. Peræopod 5, 2nd joint without any angle at the junction of hind and lower margins (contrast *bispinosa*, Chevreux and Fage, 1925, fig. 24). Uropod 2, rami slender, inner ramus feebly constricted. Uropod 3, peduncle slender, not or very feebly keeled, ending in a short point (*cf. bispinosa*, Chevreux and Fage, 1925, fig. 24). Telson appreciably longer than broad, apically rounded.

Except for the obsolete notch (figured but not mentioned by Stebbing) on side-plate 1, these specimens appear to agree with Stebbing's specimen. Beyond saying that I do not agree with Walker (1904, p. 242) in making *urodus* a synonym (the 3rd uropods are

quite different), I am not prepared to discuss the possible synonymy of this species. Walker's 1904 and 1905 records I regard as *sub judice*.

Recorded Localities in Indian Ocean.—Ceylon (Stebbing); Seychelles (Walker).

Lysianassa cœlochir (Wlkr.).

Walker, 1904, p. 243, pl. 1, fig. 7.
? Walker & Scott, 1903, p. 220, pl. 14A, fig. 4 (*urodus*).

Occurrence :

St. 74. Gulf of Oman. 1 ovig. ♀ 7 mm.

Remarks.—First joint of antenna 1 stout, without apical teeth. Side-plate 1 with notch near lower hind corner. Gnathopod 2, 6th joint distally expanded, palm concave, dactylus strongly curved. Peræopod 5, 2nd joint with no angle at junction of hind and lower margins. Uropod 2, inner ramus feebly constricted. Uropod 3, peduncle distinctly keeled on upper outer edge, inner edge very feebly keeled (see Walker's figure). Telson a little longer than broad, apically truncate, with rounded angles.

The keeled peduncle of uropod 3 is a clear distinction, in addition to the hand of gnathopod 2, between this and the preceding species. The hand of gnathopod 2 of *urodus* was not described or figured, but there is some resemblance between the 1903 and 1904 figures of the 3rd uropods.

Recorded Locality in Indian Ocean.—Ceylon (Walker); ? Abd-el-Kuri (Walker & Scott).

Lysianassa variegata (Stimpson).

Stebbing, 1888, p. 682, pl. 23.
,, 1906, p. 39.
,, 1910*a*, p. 449.

Occurrence :

St. 112. Zanzibar area. 1 ♀ 6·5 mm.

Remarks.—This specimen agrees with South African examples. The hand of gnathopod 2 is usually rather more parallel-sided than in Stebbing's figure, and the palm is usually concave (but transverse, not oblique, as in *cœlochir*), with a series of minute denticles around the inner and outer edges of the concavity (Stebbing's figure shows them on the one side only). There is a small tooth on lower apex of 1st joint of antenna 1.

The keel on peduncle of uropod 3 is not described by Stebbing, and his figure does not show it very clearly. The peduncle itself is not so stout and the keel is not so strong as in Chilton's figure (1912, 'Trans. Roy. Soc. Edinb.', xlviii, pl. 1, fig. 5) of the species there called *cubensis*.

Distribution.—South Africa (False Bay to East London).

Gen. *Aristias* Boeck.

Stebbing, 1906, pp. 49, 718.
Barnard, 1916, p. 121, and 1932, p. 43.

Aristias sp.

Occurrence :

St. 157. Maldives. 1 specimen 3·5 mm.

Remarks.—Resembles *megalops* Sars and *symbiotica* Brnrd. in the 2-jointed accessory flagellum, the telson, and the 3rd uropods. Eyes well developed, though not as large as in *megalops*, reddish.

With only one specimen available, I do not feel inclined to give a specific name. This is the first record of the genus in the Indian Ocean.

Gen. *Eurythenes* S. I. Smith.

Barnard, 1932, p. 58, and p. 55 (*Katius*).
Stephensen, 1933 (Medd. om Grönland, Bd. lxxix), p. 12.

Eurythenes gryllus (Licht.).

Barnard, 1932, p. 56, fig. 21, and pl. 1, fig. 1 (*Katius obesus*).
Stephensen, 1933 (*l.c. supra*), p. 12, figs. 4–7.

Occurrence :

St. 170. Central Arabian Sea. 1 ♀ (immature, but with oostegites) 48 mm.

Distribution.—North and South Atlantic ; North Pacific.

Gen. *Microlysias* Stebb.

Stebbing, 1918, p. 63.

Remarks.—An important character not mentioned by Stebbing is : branchiæ pleated on both sides. Both lobes of maxilla 2 are narrow. The genus is perhaps allied to *Lysianella*, in which the *penultimate* peduncular joint of antenna 2 is enlarged.

Microlysias indica n. sp. (Text-fig. 2.)

Occurrence :

St. 53. South Arabian Coast. 1 ♂ 6 mm., 3 ♀♀ 4·5–6 mm., 1 juv. 3 mm.

Description.—Very similar to *xenokeras* Stebb., but distinguished by the different profile of epistome and upper lip. In both species the 5th joint of gnathopod 1 has the lower apex projecting as a narrow lobe alongside the lower margin of 6th joint (*cf. Orchomenopsis nodimanus* Wlk.), and the telson is rather more deeply cleft than in Stebbing's figure (1918, pl. 10). Postero-inferior angle of pleon segment 3 rounded-quadrate, the hind margin with one or a very few obscure indents. Hind margins of 2nd joints of peræopods 3–5 with numerous but feeble serrations.

Remarks.—I have not seen any of Stebbing's original specimens (or indeed any from the type locality—Durban), but I have compared specimens from Plettenberg Bay, which it is reasonable to assume belong to Stebbing's species, with the above specimens from the John Murray Expedition. Both Stebbing's specimens and those collected by myself at Plettenberg Bay were found in Sea-squirts (Ascidians) but there are no data with regard to the John Murray specimens.

The present species has a strong superficial resemblance to species of *Orchomenella* (*e. g. nana*, which has been reported from Ceylon), but is easily distinguished by the doubly-pleated branchiæ and the widely expanded 4th joints of peræopods 3–5.

Gen. *Koroga* Holmes.

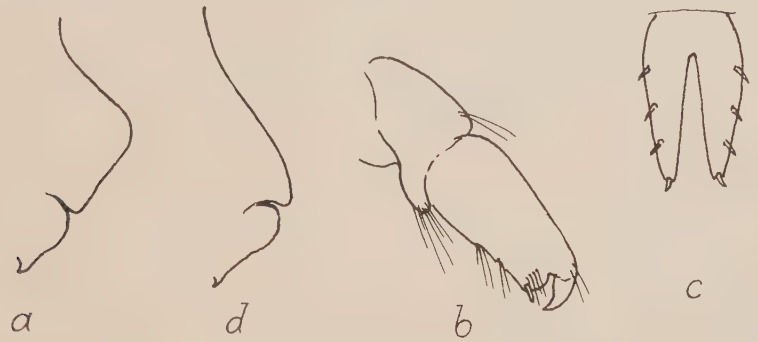
Holmes, 1908 (Proc. U.S. Nat. Mus. xxxv, 1909), p. 502.

Koroga megalops Holmes. (Text-fig. 3.)

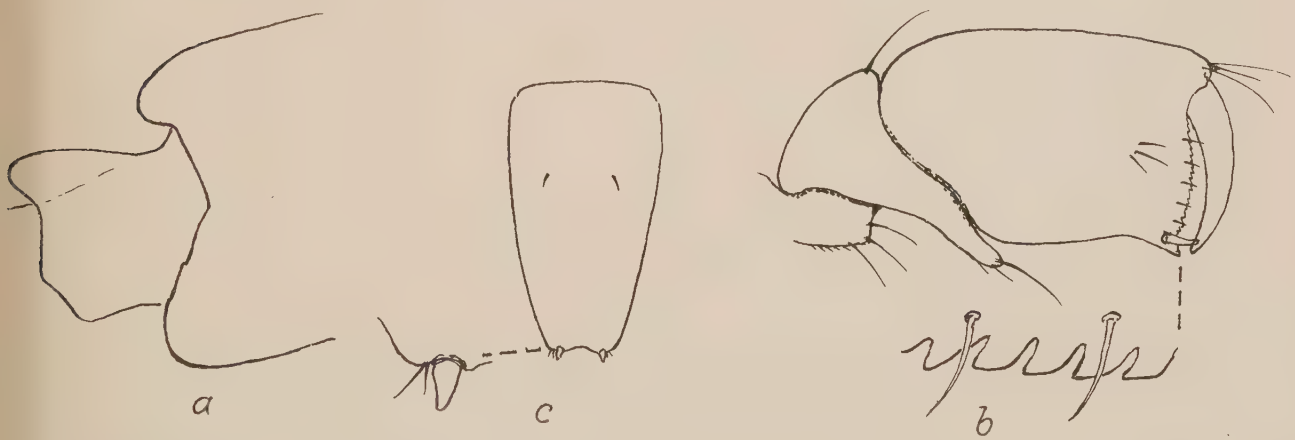
Holmes, 1908 (*l. c.*), p. 503, fig. 13.
Stephensen, 1923 (Dan. Ingolf Exp. iii), p. 60, fig. 5.

Occurrence :

St. 131 (day, 1500 metres). Southern Arabian Sea. 1 immat. ♀ 7·5 mm.



Text-fig. 2.—*Microlysias indica* n. sp. *a*, Profile of epistome and upper lip. *b*, Distal joints of gnathopod 1. *c*, Telson. *d*, Profile of epistome and upper lip of *M. xenokeras* Stebb. (Plettenberg Bay, S. Africa) for comparison.



Text-fig. 3.—*Koroga megalops* Holmes. *a*, Pleon segments 3 and 4. *b*, Hand of gnathopod 1, with palmar margin further enlarged. *c*, Telson.

Remarks.—An unexpected and noteworthy capture. Although Stephensen assigned his specimen to Holmes' species with a query, he evidently did this more on geographical than on morphological reasons, for he could find only minor differences, which possibly were due to difference in size. In the present specimen I find no essential differences.

The eyes are (or have been) maroon in colour. The molar on the mandible is a long oblique ridge. The palm of the robust hand of gnathopod 1 is minutely but deeply serrate, almost castellate, the teeth being nearly square except near the defining angle, where they become narrower and more triangular. The defining angle is a small projecting point, with a strong spine above it.

Distribution.—Alaska, 350 fathoms (Holmes); S. of Iceland, 1800 metres (Stephensen).

Gen. *Thoriella* Steph.

Stephensen, 1915, p. 39.
Pirlot, 1932 (Ann. Inst. Ocean., n.s. xii), p. 20.

Remarks.—The interpretation of the maxillipedes as given by Pirlot seems to me to be perfectly correct. Curiously enough, in the present specimen the apex of the lobe representing the remains of the palp shows a suture on the one side, exactly as in Stephensen's figures.

Thoriella islandica Steph.

Stephensen, 1915, p. 39, fig. 23.

Occurrence :

St. 76. Gulf of Oman. 1 immat. ♀ 18 mm. (to end of telson, 22 mm. to end of 1st uropod).

Remarks.—The only differences which I can find between this specimen and Stephensen's figures are as follows: 1st antennæ 18–19-jointed (3 + 15 or 16), 2nd antennæ 12–13-jointed, the proportions of the flagellar joints not quite the same as in Stephensen's figure; the palp of 1st maxilla apically rounded (but with the same deep serrations); no " broad mucronate spine " or rudimentary dactylus at end of 6th joint of gnathopod 2 concealed in the thick brush of setæ ; 2nd joint of peræopods 4 and 5 broader in proximal half, the hind margin being strongly convex.

Simple branchial lamellæ on segments 2–6. Brood lamellæ elongate, as in Stephensen's figure, and with a few long marginal setæ, on segments 2–5 ; the presence of a lamella on segment 6 (Pirlot, 1932, p. 21) would be unusual.

The head is deeply sunk in the 1st peræon segment; the ocelli (or pigment-granules) of the eyes are numerous, but somewhat loosely aggregated. Pale yellowish, the antennæ with a dull reddish tinge (as preserved).

With only such minor differences between this specimen and Stephensen's single specimen the specific identity of the two cannot be questioned, in spite of the great distance separating the two localities. It would seem that this most peculiar Amphipod is not only very rare, but that it has some special mode of life which renders its capture a matter of chance ; though it will certainly, sooner or later, be captured in some other part of the world.

Distribution.—61° 30′ N. 17° W. (Danish Oceanogr. Exp. " Thor ".)

Family Hyperiopsidæ.

Gen. *Hyperiopsis* G. O. Sars.

Stebbing, 1906, p. 714.
Walker, 1907 (Nat. Antarct. Exp. iii), p. 9.
Schellenberg, 1927 (Nord. Plankton. xx), p. 719.
Stephensen, 1934 (Tromsö Mus. Aarsheft. liii, 3), p. 4.
Pirlot, 1934, p. 167.

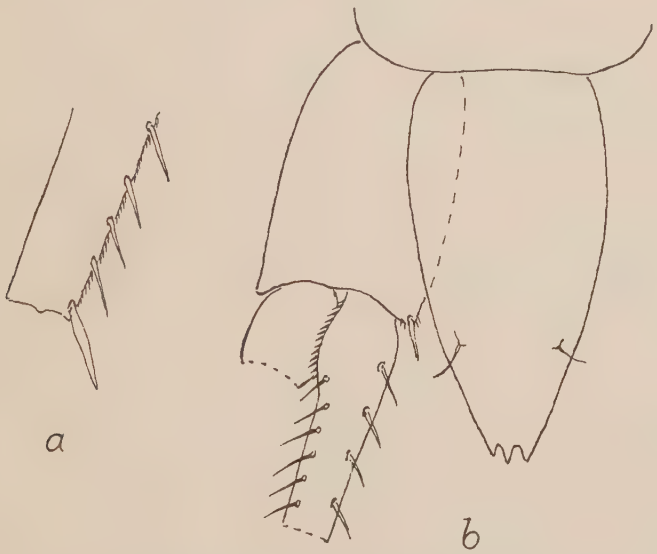
Hyperiopsis tridentata n. sp. (Text-fig. 4.)

Occurrence :

St. 61 (day, 1702 metres wire out). North Arabian Sea. 1 immat. ♀ 8 mm.

Description.—Seventh peræon segment not dorsally gibbose. Side-plates 1–4 deeper than long, more like those of *vøringii* than those of *gibbosa*. First pleon segment dorsally with basal gibbosity followed by a depression (as in Stephensen, *l. c.*, 1934, fig. 4 ; Ep. 1–3 + uros. segm. 1). Postero-inferior corner of pleon segment 1 rounded, of segments 2 and 3 quadrate with a minute point. Telson slightly longer than the half of last (6th) pleon segment, ovate-lanceolate, with tridentate apex, and a small seta (apparently arising from a minute tubercle) on each side at about $\frac{2}{3}$ the length.

No peculiarities in the antennæ. The mouth-parts were not dissected, but examined *in situ*, and apparently agree with the descriptions of Stephensen and Pirlot (1st maxillæ asymmetrical).



Text-fig. 4.—*Hyperiopsis tridentata* n. sp. *a*, Distal portion of peduncle of uropod 1. *b*, Telson and uropod 3.

Gnathopods 1 and 2 and peræopod 1 not differing from those of *vøringii* ; 4th joint of peræopod 1 resembles Stephensen's figure (*l. c.*, 1934) of this joint in *vøringii* (not Pirlot's figure of that of *gibbosa*), but is even slightly more robust, with a slightly larger projecting lobe at upper apex.

Large simple branchiæ on segments 2–7. Slender narrow oostegites (without marginal setæ) on segments 2–5.

Uropod 1, peduncle extends to base of telson, inner margin with long spaced spines, and very minute close-set spinules ; rami slender, only slightly shorter than the peduncle.

Uropod 2, only a small basal portion of the peduncle on both sides remains, but the inner margin bears close-set spinules as in uropod 1.

Uropod 3, peduncle shorter than telson and consequently much stouter than in any of the other species ; there is one spine and a few minute spinules on inner apex, but inner and outer margins are unarmed ; rami incomplete, but the inner ramus is at least as long as peduncle, with spaced spines on both margins ; a slight swelling on outer margin proximally, with a series of minute close-set spinules.

Remarks.—The outstanding features of this specimen are the telson and 3rd uropods. Although there are certain points of resemblance to the Arctic *vøringii* (*e. g.* 4th joint of peræopod 1), the telson shows an approximation to that of *gibbosa* from the East Indies. The 3rd uropods are very different from those of any of the other three species of the genus.

Family Stegocephalidæ.

Gen. *Parandania* Stebb.

Stebbing, 1906, p. 95.

Parandania boecki (Stebb.).

Walker, 1909, p. 330.
Schellenberg, 1926*a*, p. 223, fig. 28*c*.
Barnard, 1932, p. 77, fig. 35.

Occurrence :

St. 172. Central Arabian Sea. 1 immat. 14·5 mm.

Remarks.—Pleon segment 3 and postero-inferior angle of 2nd joint of peræopod 5 not so sharp as figured for the " Discovery " specimen, and 6th joints of peræopods 3 and 4 not elongate.

Recorded Localities in Indian Ocean.—Seychelles (Walker), 30° S. 87° 50′ E. and 4°–6° S. 73° E. (Schellenberg).

Distribution.—Atlantic ; South Africa.

Family Ampeliscidæ.

Gen. *Ampelisca* Kröyer.

Barnard, 1916, p. 132, and 1925, p. 335.
Schellenberg, 1925, p. 120.

Remarks.—The number of specimens of this genus in the present collection is not great, and except that the specimens identified as *cyclops* undoubtedly belong to Walker's species, and that *chevreuxi* is probably a synonym of *zamboangæ*, I am not at all satisfied that the present identifications with previously known species are correct.*

Ampelisca brevicornis (Costa).

Sars, 1891, p. 169, pl. 59, fig. 1 (*lævigata*).
Walker, 1904, p. 253.
Stebbing, 1906, p. 100.
Chevreux & Fage, 1925, p. 78, fig. 69.
Schellenberg, 1925, p. 130, fig. 9 (with vars.) ; and 1928, p. 634.
Pirlot, 1936, p. 277.

Occurrence :

St. 179 (310 metres). Gulf of Aden. 1 ovig. ♀ 8 mm.

Remarks.—In the form of the hind margin of pleon segment 3, this specimen agrees with Schellenberg's var. *intermedia*.

Recorded Localities in Indian Ocean.—Ceylon (Walker), Bagamoyo (Schellenberg var. *intermedia*), Suez (Schellenberg).

* Since this was written Pirlot (1936) has expressed the same opinion regarding *chevreuxi*,

Distribution.—N. Atlantic; Mediterranean, west, south and east coasts of Africa; Java; Japan.

Ampelisca tenuicornis Lilj.

Sars, 1891, p. 167, pl. 58, fig. 1.
Chevreux & Fage, 1925, p. 83, fig. 75.
Schellenberg, 1925, p. 122.

Occurrence:

St. MB II C. South Arabian coast. 4 specimens 4–5·5 mm.

St. Extra. South Arabian coast. 1 specimen 4·5 mm.

Remarks.—Pleon segments 4 and 5 both with rounded medio-dorsal keels. Postero-inferior angle of pleon segment 3 rounded-quadrate.

Distribution.—Western Europe and Africa to Senegal; Mediterranean.

Ampelisca zamboangæ Stebb.

Stebbing, 1888, p. 1057, pl. 106.
Walker, 1904, p. 254, pl. 3, fig. 15 (*chevreuxi*).
Pirlot, 1936, p. 280.

Occurrence:

St. 10. Red Sea. 2 specimens 6 mm.

St. B. Red Sea. 1 ovig. ♀ 10 mm.

Remarks.—First antennæ extending beyond end of peduncle of 2nd antennæ. The bevelling off of the distal third of the front margin of 3rd joint of peræopod 5 is certainly very noticeable, but is scarcely a specific character as claimed by Walker (see Stebbing's figure).

This species is very closely allied to the European and Mediterranean *typica* (Bate), but differs in the relative lengths of the 6th and 7th joints of peræopod 5, and of the penultimate and ultimate peduncular joints of 2nd antennæ—characters which appear to be somewhat inconstant.

Recorded Locality in Indian Ocean.—Ceylon (Walker, *chevreuxi*).

Distribution.—Philippine Islands; East Indies.

Ampelisca cyclops Wlkr.

Walker, 1904, p. 253, pl. 2, fig. 14.
Pirlot, 1936, p. 280.

Occurrence:

St. 74. Gulf of Oman. 2 ♀♀ 12 mm., 2 juv. 6–7 mm.

Remarks.—There is only a single lens on each side of the head at the apex; in the present specimens no red pigment surrounding the lenses. First antennæ extending to just beyond end of 4th joint of peduncle of 2nd antennæ, which is slightly longer than 5th joint; 2nd antennæ reaching to about middle of pleon. Mandibular palp slender, as described by Walker, the 2nd joint slightly longer than the 3rd (Walker's figure shows a 4-jointed palp due to the accidental division of the 2nd joint by a cross-line). Seventh joint of peræopods 1 and 2 twice (in juv.) or almost twice the combined lengths of 5th and 6th joints. Third joint of peræopod 5 distinctly longer than 4th. Telson with lateral margins evenly converging to the apex. Walker does not give the size of his specimens.

Recorded Locality in Indian Ocean.—Ceylon.

Distribution.—East Indies.

Ampelisca cf. *abyssicola* Stebb.

Stebbing, 1888, p. 1047, pl. 104.
,, 1906, p. 104.

Occurrence :

St. 105. Zanzibar area. 1 ♂ mutilated, 1 ♀ with developing brood-plates, 17 mm.

Description.—Two corneal lenses on each side of head. Postero-inferior angle of pleon segment 3 quadrate, with small point. Pleon segment 4 medio-dorsally keeled. Side-plate 4 with the same obtuse angle between lower and hind margins as in the " Challenger " figure, but the lower margin distinctly shorter than the hind margin, instead of *vice versâ*.

Second joint of mandibular palp moderately laminar.

First antenna equal to head plus peræon segments 1–3, 2nd joint twice length of 1st, flagellum *ca.* 14-jointed. Second antennæ missing.

Peræopods 1, 2, 4th joint not apically lobed, 7th equal to, or slightly longer than, the 6th plus twice the length of 5th.

Peræopod 5 as in *abyssicola*; 2nd joint with the plumose setæ continued round on to margin opposite 3rd and 4th joints (but not so definitely as in *Byblis*); 3rd and 4th joints broader than long; 3rd shorter than 4th, 5th equal to 3rd plus 4th, and almost as broad as these joints, 6th shorter and narrower than 5th (but longer than 4th), oval, 7th subequal to 6th, narrow-lanceolate.

Remarks.—There is considerable similarity between these specimens and the " Challenger " species, which was caught in the West Indies at 390 fathoms, but I do not regard the identification as absolutely certain.

Ampelisca cf. *daleyi* Giles.

Giles, 1890, p. 66, pl. 2, fig. 3.
Stebbing, 1906, p. 111.
Not *Byblis daleyi*, Pirlot, 1936, p. 284.

Occurrence :

St. 157. Maldives. 1 ♀ with embryos 5·5 mm.

Description.—Two rather large corneal lenses on each side of head. Postero-inferior angle of pleon segment 3 quadrate, and pleon segment 4 dorsally keeled (as in *æquicornis* or *anomala*, Sars, pl. 62).

Mandibular palp rather slender. First antenna extending to $\frac{2}{3}$ length of 4th joint of antenna 2, which is equal to length of head plus peræon segments 1 and 2 ; 5th joint and flagellum broken off.

Peræopods 1, 2, 4th joint not apically lobed, 7th equal to 5th plus 6th.

Peræopod 5, 2nd joint shaped as in *zamboangæ*; lobe extending to end of 3rd joint, which is a little shorter than 4th, which is subequal to 5th; 6th slightly longer than 5th, oval, 7th shorter than 6th.

Remarks.—While the 4th peduncular joint of antenna 2 is unusually long, as in *daleyi*, the 5th peræopod does not agree with that of the latter species, which closely resembles in the shape of the 2nd joint a species of *Byblis*.

Stebbing regarded *daleyi* as insufficiently described, but two of the alleged peculiarities in Giles' *figure* may, I think, be explained. The front part of the 2nd joint of peræopod

3 is filled with muscles, while the hind, more or less lobed part is clear, and the junction of the two parts is indicated by a shallow indent on the hind margin ; a glance at some of the figures in Sars, or Stebbing's " Challenger " report, will show how easy it would be for an artist to draw a line connecting the anterior corner of side-plate 5 with the indent on the hind margin of 2nd joint of peræopod 3, following the demarcation of the muscles, and thus produce the anomalous side-plate 5 with " hind border notched ". The elongate 7th joints on peræopods 3 and 4 are also anomalous, and probably some of the long setæ on the apex of the 6th joint were stuck together, giving the artist the impression of a joint. I am aware that Giles drew his own figures, but lithography was not always to be trusted.

A. daleyi was originally found off Madras, and it should not be difficult to rediscover the species and determine its identity.

Gen. *Byblis* Boeck.

Barnard, 1916, p. 139.
Pirlot, 1936, p. 282.

Byblis lepta (Giles).

Giles, 1888, p. 223, pls. 8, 9.

Occurrence :

St. 45. South Arabian coast. 1 specimen 5 mm.
St. 74. Gulf of Oman. 1 specimen 8 mm.
St. 164. Maldives. 3 specimens 5–6 mm.

Remarks.—It is unfortunate that all the specimens are somewhat mutilated. They are, however, easily identified as Giles' species by the dark brown pigment surrounding the large corneal lenses.

Two of the specimens (St. 164) show the elongate 2nd peræopod (one of these is a ♀), and both of them have elongate pleated branchiæ. One other specimen from St. 164, and the one from St. 45, have simple rather thick sac-like branchiæ, while the one from St. 74 has similar (not elongate) branchiæ with a few pleats on each side.

The species has not been recorded since Giles' time, but the present specimens scarcely lend themselves for the purpose of refiguring.

Recorded Locality in Indian Ocean.—Bay of Bengal, 107 fathoms.

Family Amphilochidæ.

Gen. *Amphilochus* Bate.

Stebbing, 1906, pp. 149, 723.

Amphilochus neapolitanus Della Valle.

Walker, 1904, p. 255 (?).
Chevreux & Fage, 1925, p. 112, figs. 106–108.

Occurrence :

St. 45. South Arabian coast. 1 ♂ 3·75 mm.

Remarks.—Mandibular molar weak. Process of 5th joint of gnathopod 2 extending to palm, which is nearly transverse.

Walker recorded a young specimen with some doubt as this species. Chilton (1921, p. 524, 1923, p. 83, 1925, p. 533) has recorded the Chilka Lake and Talé Sap specimens as *brunneus* because the process of 5th joint of gnathopod 2 did not reach the palm. Moreover he said the specimens from both localities had well-developed mandibular molars, which would place them in the genus *Gitanopsis*. In my opinion the Chilka Lake, Talé Sap and Australian specimens should be re-examined, as Chilton was inclined to unite several species which other authors kept separate (*e. g.* the South African *Gitanopsis pusilla* was made a synonym of *A. neapolitanus*, with which synonymy neither Schellenberg nor myself agree).

Recorded Locality in Indian Ocean.—Ceylon.

Distribution.—North Sea; Mediterranean; Canaries; Sahara coast.

Family Leucothoidæ.

Gen. *Leucothoë* Leach.

Barnard, 1925, p. 342.

Leucothoë spinicarpa (Abildg.).

Walker, 1904, p. 258, 1905, p. 925, and 1909, p. 331.
Gravely, 1927, p. 123.
Schellenberg, 1928, p. 687.

Occurrence:

St. 9. Red Sea. 1 ♂ 9 mm.
St. 10. Red Sea. 2 ♂♂ 8–9 mm., 1 ovig. ♀ (mutilated), 13 immat. and juv. 3–5·5 mm.
St. B. Red Sea. 3 specimens 4, 5 and 7 mm.
St. 45. South Arabian coast. 2 ♂♂ 9·5 and 10·5 mm.
St. 111. Zanzibar area. 1 specimen 5·5 mm.
St. 112. Zanzibar area. 1 specimen 6·5 mm.

Recorded Localities in Indian Ocean.—Ceylon, Maldives and Laccadives, Seychelles, Wasin (B.E.A.), Suakim (Walker); Red Sea (Spandl).

Distribution.—Cosmopolitan.

Leucothoë furina (Sav.).

Walker, 1904, p. 258, pl. 3, fig. 17; 1905, p. 925, and 1909, p. 331 (*hornelli*).
Chevreux, 1907, p. 470 (*hornelli*).
Schellenberg, 1928, p. 635.

Occurrence:

St. 53: South Arabian coast. 1 ♂ 8 mm.

Recorded Localities in Indian Ocean.—Ceylon, Maldives, Red Sea (Walker); Red Sea (Spandl); Suez (Schellenberg).

Distribution.—Gambier Archipelago (Chevreux); East Indies and Australia (Schellenberg, var. *indica*).

Gen. *Leucothoëlla* Schell.

Schellenberg, 1928, p. 638.

Leucothoëlla bannwarthi Schell.

Schellenberg, 1928, p. 638, fig. 199.

Occurrence :

St. 10. Red Sea. 3 specimens 3, 3·5 and 5 mm.

Recorded Localities in Indian Ocean.—Suez and Toussoum (Schellenberg).

Family Stenothoidæ.

Gen. *Stenothoë* Dana.

Stebbing, 1906, pp. 192, 725.

Stenothoë antennulariæ Della Valle. (Text-fig. 5.)

Della Valle, 1893, p. 565, pl. 30, figs. 1–18.
Walker, 1897 (J. Linn. Soc. Lond. xxvi), p. 229, pl. 18, fig. 3 (*crassicornis*).
Stebbing, 1906, p. 195.

Occurrence :

St. 45. South Arabian coast. 1 ♂ 2·5 mm.

Remarks.—This specimen has the curious strong bend at the base of 2nd joint of gnathopod 1 characteristic of this species. The hand of gnathopod 2 is more elongate-oval than any of those in Della Valle's and Walker's figures ; and this specimen appears

Text-fig. 5.—*Stenothoë antennulariæ* Della Valle. Hand of gnathopod 2, ♂.

to be the fully adult form of the ♂. Peduncle of uropod 3 subequal to the ramus, the 1st and 2nd joints of which are subequal. Telson with 3 spinules on each lateral margin. The discovery of this species in the Indian Ocean is interesting.

Distribution.—Gulf of Naples (Della Valle) ; Irish Sea (Walker).

Stenothoë gallensis Wlkr.

Walker, 1904, p. 261, pl. 3, fig. 19, and 1909, p. 331.
Barnard, 1916, p. 154.
Schellenberg, 1928, p. 640.
Chevreux, 1907, p. 471, figs. 1–3 (*crenulata*).
Shoemaker, 1935, p. 237, fig. 2 (*crenulata*).

Occurrence :

St. 10. Red Sea. 2 immature 2 mm.

Remarks.—The specimens are probably this species. They are dark maroon in colour. Gravely (1927, p. 123) records specimens of *valida* (identified by Chilton) from Ceylon as being " almost black ".

Recorded Localities in Indian Ocean.—Ceylon, Seychelles, Zanzibar, Red Sea, (Walker); Dar-es-Salaam (Schellenberg).

Distribution.—South Africa; Gambier Archipelago (Chevreux); Porto Rico (Shoemaker).

Family Colomastigidæ.

Gen. *Colomastix* Grube.

Barnard, 1932, p. 114.

Colomastix pusilla Grube.

Kossmann, 1880, p. 136 (*hamifera*).
Walker, 1904, p. 299, and 1909, p. 332 (*crassimanus*).
Chilton, 1925, p. 533.
Schellenberg, 1928, p. 687, footnote.

Occurrence :

St. 10. Red Sea. 1 ♀ 2 mm.

Recorded Localities in Indian Ocean.—Red Sea (Kossmann, Spandl, Walker); Suez (Schellenberg); Ceylon (Walker); Perak (Chilton).

Distribution.—North Atlantic; Mediterranean.

Family Acanthonotozomatidæ.

Gen. *Iphimedia* Rathke.

Barnard, 1932, p. 118.

Iphimedia gladiolus n. sp. (Text-figs. 6 and 7.)

Occurrence :

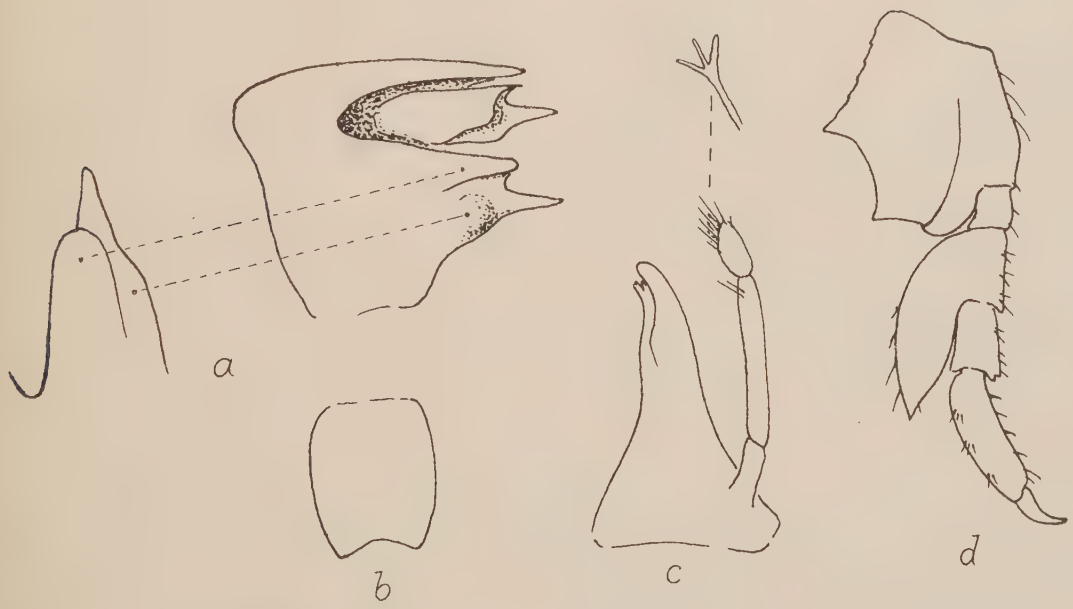
St. 45. South Arabian coast. 1 ♀ 7 mm.

Description.—Rostrum broadly triangular, slightly longer than basal width, not curved downwards. Lateral angle of head with two teeth, the upper in dorsal view rounded, the lower conical and acute. Eyes not traceable. Peræon segments 1 and 7 longest, 2–6 short, especially 2. Postero-inferior angles of segments 5–7 subacute or acute. Side-plates 1–4 acute below, 5–7 with postero-inferior angles acute. Peræon segment 7 and pleon segments 1–3 each with a pair of dorsal teeth and a medio-dorsal keel. Postero-inferior angles of pleon segments 1 and 2 subacute, of 3 acute, each segment with a tooth on hind margin. Pleon segment 4 with medio-dorsal triangular keel. Telson scarcely half as long again as broad, apex feebly emarginate.

First antennæ, 1st joint with an apical dorsal tooth, and a larger one on inner apical margin, the rest of the joints missing. Second antennæ missing. Epistome with feeble median boss. Upper lip feebly incised. Mandible slender on broad triangular base,

apically subacute, secondary cutting plate in left mandible only, palp slender, 3rd joint with some of the setæ trifid. Palp of 1st maxilla extending to end of outer plate (in both the apical setæ and spines are not reckoned). Palp of maxilliped slender.

Text-fig. 6.—*Iphimedia gladiolus* n. sp. Peræon segments 5–7, with 2nd joint of peræopods 3–5 respectively, and pleon segments 1–3 with profile of segments 4–6 and telson.



Text-fig. 7.—*Iphimedia gladiolus* n. sp. *a*, Lateral view of head and basal joint of 1st antenna, with dorsal view of the right antero-lateral angle of head. *b*, Telson. *c*, Mandible. *d*, Peræopod 5.

Gnathopod 1, 2nd joint curved, 6th slightly shorter than 5th. Gnathopod 2, 6th joint equal in length to the lower margin of 5th (but shorter if the upper margin of the latter is measured), its apex rounded. Peræopods 1 and 2 stout, anterior projection of 4th joint reaching to middle of 5th. Peræopods 3–5 stout; 2nd joint with 2 teeth on hind margin, the lower one in peræopod 3 very feeble; posterior process of 4th joint strongly

developed, extending in peræopods 3 and 4 to $\frac{1}{4}$, in peræopod 5 to $\frac{1}{3}$ length of 6th joint. Uropods not strongly spinose.

Remarks.—A species with a strong resemblance to *Panoplæa eblanæ*, but with the additional medio-dorsal keel on peræon segment 7 which the Mediterranean species lacks. The peræopods are much more robust in the present species, the specific name alluding to the appearance of the 4th joint of peræopods 3–5.

The palp of 1st maxilla appears to be intermediate between that of *Iphimedia*, where it exceeds the outer lobe, and that of *Panoplæa*, where it is feebly developed and does not reach the apex of the outer lobe. Further study must decide into which of these two genera the present species should fall ; *Iphimedia* is here chosen as being the older genus.

Schellenberg (1928, p. 643) has recorded a specimen of this genus from the Suez Canal, which he identified, in spite of certain differences, with the Australian *discreta* Stebb. (1910, p. 586, pl. 49). The present species differs from *discreta* and from another Australian species, *ambigua* Hasw., in the additional medio-dorsal keel on four segments of the body.

Family Synopiidæ.

Gen. *Synopia* Dana.

Synopia ultramarina Dana.

Walker, 1909, p. 332 (*schéeleana*).
Spandl, 1924, p. 47, fig. 17*h*.
Schellenberg, 1926, p. 341, fig. 49.
Barnard, 1930, p. 367, and 1931, p. 122.

Occurrence :

St. 61 (night, surface). Northern Arabian Sea. 29 ♂♂ 3–4 mm., 43 ♀♀, some ovig. 3–3·5 mm.

Remarks.—A few of the specimens are ensconced in Salps in such a way as to indicate that they have taken up this abode of their own accord, and have not merely been pressed into the Salps in the tow-net.

Recorded Localities in Indian Ocean.—Seychelles (Walker) ; Red Sea (Spandl).

Distribution.—Tropical Atlantic, Indo-Pacific.

Family Œdicerotidæ.

Gen. *Œdiceroides Stebb.*

Pirlot, 1932, p. 87.
Barnard, 1932, p. 140 (references).

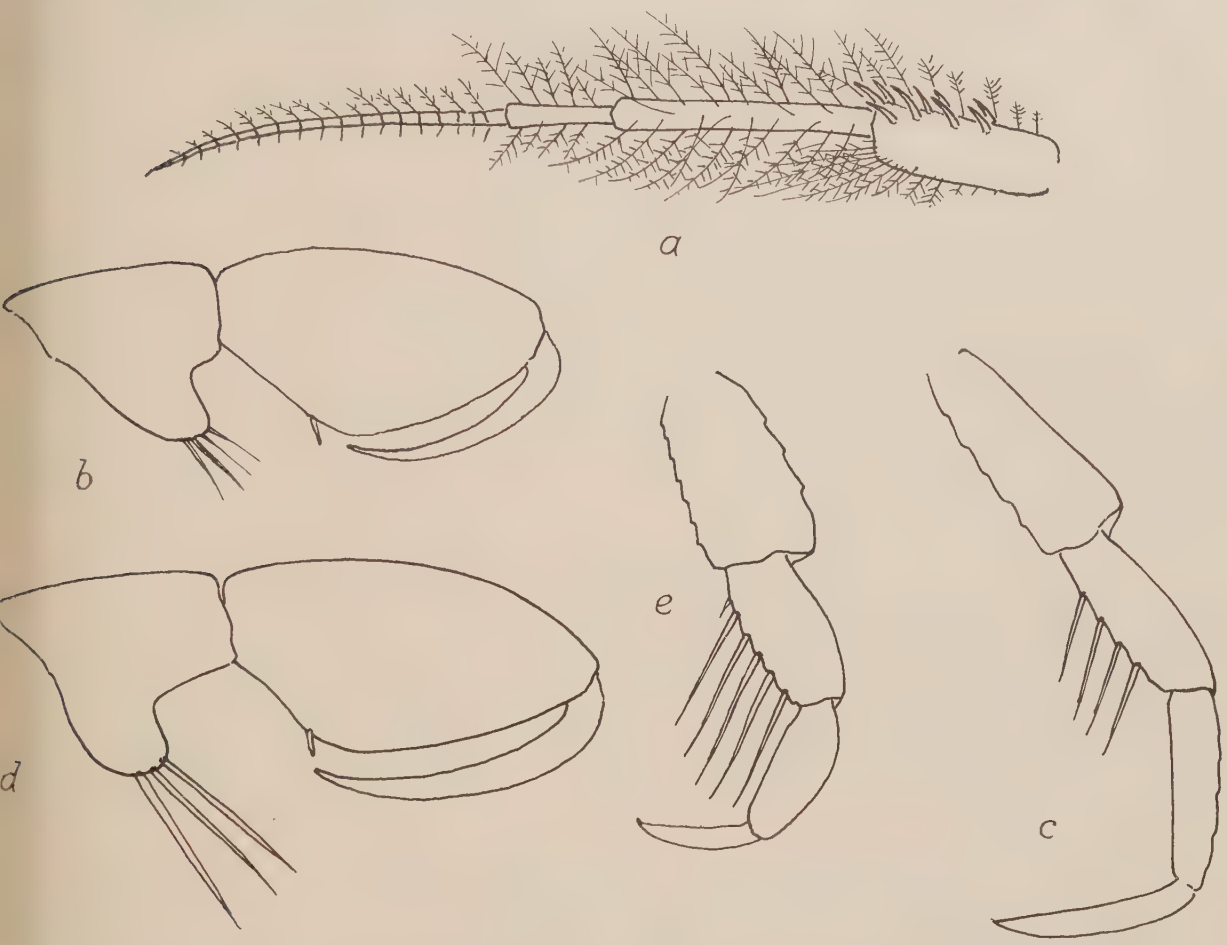
Œdiceroides antennatus n. sp. (Text-fig. 8, *a*, *b*, *c*.)

Occurrence :

St. 119. Zanzibar area. 2 ♀♀ (1 ovig.) 19 and 20 mm.

Description.—Very close to *weberi* Pirlot from the East Indies. Integument smooth and glabrous. Rostrum as in *weberi*, its medio-dorsal keel extending nearly to hind margin of head. Eyes or ocular pigment not traceable. Antero-lateral angle of head truncate. First antenna extending to middle of 5th joint of peduncle of 2nd antenna, *2nd joint longer than 1st*, the latter with strong spines on upper margin, flagellum *ca.* 19-jointed. Second

antenna with 5th peduncular joint shorter and more slender than 4th. Third joint of mandibular palp shorter than 2nd; triturating surface of molar directed inwards, not obliquely towards base of mandible. Side-plate 4 feebly excavate on hind margin, as in *cinderella* and *weberi*. Peræopods as in *weberi*, but distal joints of peræopods 1 and 2 more elongate; 4th joint in peræopods 3 and 4 well expanded. Branchiæ simple.



Text-fig. 8.—*Œdiceroides antennatus* n. sp. *a*, 1st antenna. *b*, *c*, Distal joints of gnathopod 1 and peræopod 2 respectively. *Œdiceroides zanzibaricus* n. sp. *d*, *e*, Distal joints of gnathopod 1 and peræopod 2 respectively.

Remarks.—The spines on the 1st joint of antenna 1 are not distinctive; they occur in the South African specimens assigned to *cinderella* (Barnard, 1916, p. 162). The length of the 2nd joint, however, is distinctive, and separates these specimens from any of the described species.

Œdiceroides zanzibaricus n. sp. (Text-fig. 8, *d*, *e*.)

Occurrence:

St. 120. Zanzibar area. 1 ovig. ♀ 21 mm.

Description.—In comparison with *cinderella*, *weberi* and *antennatus*, the following points are to be noted: Integument smooth and glabrous. Rostrum more strongly deflexed than in *antennatus*, its dorsal keel less conspicuous and not continued so far towards back of head. Eyes or ocular pigment not traceable. Antenna 1 not strongly

plumose, 1st joint without spines, 2nd joint slightly shorter than 1st, 3rd slightly shorter than 2nd, flagellum *ca.* 25-jointed. Antenna 2 missing. Third joint of mandibular palp shorter than 2nd, triturating surface of molar not oblique. Gnathopods 1 and 2, 5th joint with a noticeably longer "neck" between the lower lobe and the junction with 6th joint; lobe with strong elongate spines, 6th with greatest breadth slightly before the middle. Peræopods 1 and 2, especially 2, with 4th–6th joints stout, 4th particularly so, 5th with very long spines on lower margin. Side-plate 4 feebly excavate on hind margin. Other peræopods as in *antennatus*. Branchiæ simple.

Family Pleustidæ.

Gen. *Sympleustes* Stebb.

Chevreux, 1900, p. 73 (*Dautzenbergia*).
Stebbing, 1906, p. 317, and pp. xxviii, 728 (*Dautzenbergia*).
Sexton, 1909 (Proc. Zool. Soc. Lond.), p. 857.

Remarks.—Sexton thinks there is not enough justification for the separate genus *Dautzenbergia*. Chevreux (1920, 'Bull. Mus. d'Hist. Nat. Paris', p. 8) seems to have adopted the same view in describing *dentatus* n. sp. (Canary Islands) as a species of *Sympleustes*. This species also has a cleft telson, and in fact is exceedingly close to *grandimanus*, if not actually conspecific.

Sympleustes (*Dautzenbergia*) *grandimanus* (Chevr.).

Chevreux, 1887 (Bull. Soc. Zool. Fr. xii), p. 570.
,, 1900, p. 73, pl. 10, fig. 1 (♀).
Walker, 1897 (J. Linn. Soc. Lond. xxvi), p. 230, pl. 18, fig. 4 (♂) (*Parapleustes megacheir*).
Stebbing, 1906, pp. xxviii, 317, 728.
Sexton, 1909 (Proc. Zool. Soc. Lond.), p. 857, pl. 80, figs. 8–32, and pp. 849, 850 (sex and age variations).
,, 1911 (J. Mar. Biol. Assoc. Plymouth, ix), p. 209.

Occurrence:

St. 54. South Arabian coast. 1 immature ♀ 6·5 mm.

Remarks.—The telson just reaches to end of peduncle of uropod 3. Lower margin of hand of gnathopod 1 regularly convex, without palmar angle. Palm of gnathopod 2 regularly but very minutely crenulate; near the finger-hinge two very low squarish projections separated by a minute notch.

Distribution.—Atlantic: Off Cape Finisterre, 510 metres (Chevreux), S.W. of Ireland, 750 fathoms (Walker), Bay of Biscay (Sexton).

Family Eusiridæ.

Gen. *Eusiropsis* Stebb.

Stebbing, 1906, p. 343.

Eusiropsis riisei Stebb.

Stebbing, 1897, p. 39, pls. 13, 14, and 1906, p. 343, figs. 80, 81.
Walker, 1909, p. 334.
Schellenberg, 1926, p. 351.
Barnard, 1932, p. 387, fig. 48.
Pirlot, 1934, p. 215.

Occurrence :

St. 172. Central Arabian Sea. 1 ♂ 10 mm.

Recorded Locality in Indian Ocean.—Seychelles (Walker).

Distribution.—Atlantic, East Indies (Pirlot).

Family Gammaridæ.

Gen. *Melita* Leach.

Stebbing, 1906, pp. 421, 732.

Melita fresnelii (Aud.).

Giles, 1890, p. 64, pl. 2, fig. 1 (*cotesi*).
Walker, 1904, p. 270, pl. 4, fig. 28 (*anisochir*).
„ 1909, p. 334.
Barnard, 1916, p. 189, pl. 28, fig. 32.
Schellenberg, 1928, p. 644.
Shoemaker, 1935, p. 239.

Occurrence :

St. 10. Red Sea. 2 ♀♀ 5 and 6 mm.

St. 24. Gulf of Aden. 2 ♂♂ 3·5–4·5 mm., 2 ovig. ♀♀ 3·5–4 mm., 2 immat. 3 mm.

St. 112. Zanzibar area. 1 immat. 4 mm.

Recorded Localities in Indian Ocean.—Andaman Is. (Giles) ; Ceylon, Seychelles, Wasin (B.E.A.), Suakim (Walker) ; Suez Bay (Schellenberg).

Distribution.—Western tropical Atlantic ; Egypt and Suez Canal ; East Indies ; South Africa ; Australia ; California.

Gen. *Mœra* Leach.

Stebbing, 1906, pp. 433, 732.

Mœra inœquipes (Costa).

Kossmann, 1880, p. 133 (*massavensis*).
Miers, 1884, p. 567, pl. 52, fig. D (*diversimanus*).
Walker, 1904, p. 273, pl. 5, fig. 32 (*scissimana*).
„ 1909, p. 334.
Schellenberg, 1928, p. 646.

Occurrence :

St. 10. Red Sea. 1 ♂ 4·5 mm.

St. D. Red Sea. 1 ♂, 1 ovig. ♀ 5 mm.

St. 53. South Arabian coast. 1 ♀ 5 mm.

Recorded Localities in Indian Ocean.—Red Sea (Kossmann, Spandl) ; Seychelles (Miers) ; Maldives, Seychelles, Wasin, Suez, Suakim (Walker) ; Suez (Schellenberg).

Distribution.—Bermuda ; Azores and Canaries ; Mediterranean ; South Africa ; Australasia ; Chile.

Gen. *Ceradocus* Costa.

Stebbing, 1906, p. 430.

Ceradocus rubromaculatus (Stimpson). (Text-fig. 9.)

Walker, 1904, p. 272, pl. 5, fig. 30; 1905, p. 927; 1909, p. 334.
Chevreux, 1907, p. 479, fig. 6.
Chilton, 1921*a*, p. 71, fig. 9.
Tattersall, 1922, p. 6, pl. 1, figs. 15, 16.
Schellenberg, 1925, p. 154, and 1928, p. 644.
Pirlot, 1934, p. 222.

Occurrence:

St. 10. Red Sea. 1 ♂ 6·5 mm.

Remarks.—The hand of gnathopod 2 on the right side is intermediate between Chilton's and Tattersall's figures, oval, without any defining angle, palm with two small notches between flat-topped projections. The gnathopod on the left side is much smaller, shaped as in the ♀.

Text-fig. 9.—*Ceradocus rubromaculatus* (Stimpson). Hand of gnathopod 2, ♂ (right side).

Recorded Localities in Indian Ocean.—Maldives, Ceylon, Seychelles, Wasin (B.E.A.), Red Sea (Walker); Suez (Schellenberg).

Distribution.—South Africa; East Indies; Australia; New Zealand, and Gambier Archipelago.

Gen. *Elasmopus* Costa.

Stebbing, 1906, pp. 441, 732.
Stephensen, 1932, p. 487.
Pirlot, 1936, p. 312.

Remarks.—In Stephensen's list of species *latibrachium* Wlkr., 1905, should be transferred from Group A to Group Ci, as it has paired dorsal processes on pleon segment 4.

Elasmopus subcarinatus (Hasw.).

Walker, 1904, p. 275, pl. 5, fig. 34, and 1909, p. 335.
Gravely, 1927, p. 123.
Stephensen, 1931, p. 11.
Barnard, 1935, p. 286.

Occurrence:

St. 45. South Arabian coast. 6♂♂ 6–9·5 mm., 4 ovig. ♀♀ 4·5–7 mm., 11 immature and juv. 3–6 mm.

Recorded Localities in Indian Ocean.—Ceylon and Seychelles (Walker); Ceylon (Gravely); Tuticorin Pearl Banks (Barnard).

Distribution.—East Indies; Australasia; South Africa.

Elasmopus pectenicrus Bate.

Kossmann, 1880, p. 132 (*brasiliensis* ? non Dana).
Walker, 1904, p. 277, pl. 8, fig. 34 (*serrula*), and 1909, p. 336 (*serruta*).
Barnard, 1916, p. 197, pl. 28, fig. 33.
Gravely, 1927, p. 123.
Schellenberg, 1928, p. 647.
Shoemaker, 1935, p. 238.
Pirlot, 1936, p. 312.

Occurrence:

St. 53. South Arabian coast. 1 juv. 4·5 mm.

Recorded Localities in Indian Ocean.—Red Sea (Kossmann, Spandl); Ceylon, Zanzibar, Suez (Walker); Ceylon (Gravely); Suez and Dar-es-Salaam (Schellenberg).

Distribution.—New Guinea; South Africa; East Indies; Porto Rico, W.I.

Elasmopus erythræus (Kossm.). (Text-fig. 10.)

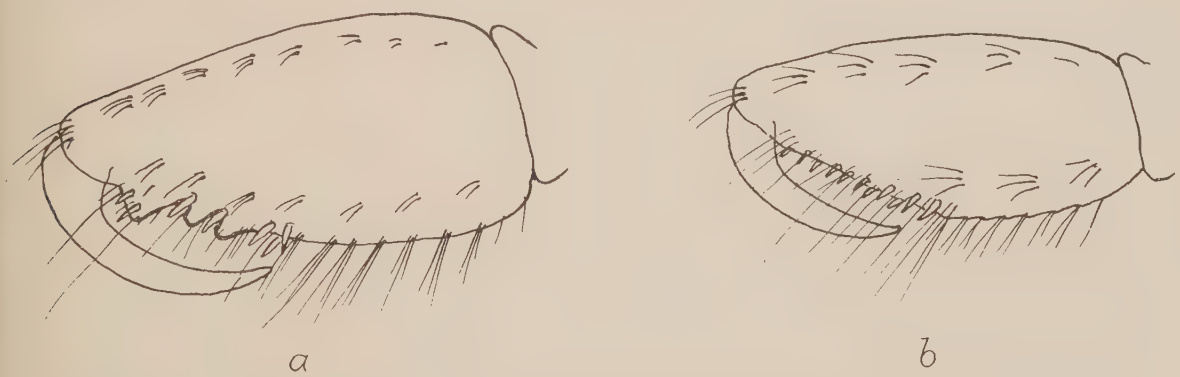
Kossmann, 1880, p. 132, pl. 14, figs. 1–8 (*Moera e.*).
Stebbing, 1906, p. 446 ("probably young of another species").

Occurrence:

St. B. Red Sea. 1 ♂, 1 ♀ 7 mm., 1 immat. 6·5 mm., 1 juv. 4 mm.

St. 53. South Arabian Sea. 1 ♂ 6·5 mm., 1 ovig. ♀ 8 mm., 1 juv. 4·5 mm.

Description.—Accessory flagellum of 1st antenna short, 3-jointed. Mandibular palp as in *rapax* and Kossmann's figure. Peræopods 3–5, 2nd joint with a few rather widely-spaced serrations on hind margin.



Text-fig. 10.—*Elasmopus erythræus* (Kossm.). *a*, *b*, Hand of gnathopod 2, ♂ and ♀ respectively.

No segments dorsally dentate, but peræon and pleon sparsely setose, as in *carnleyi* Steph., *rapax* (*fide* Kunkel, 1910) and *sokotræ* (Walker and Scott's figure). Postero-inferior angle of pleon segment 3 quadrate with short point. Telson—in notch at apex of each lobe 2 long spines flanked on inner side by 1 shorter one, and on outer side by 1 short spine-seta, one spine-seta on lateral margin (see Kossmann's figure).

Remarks.—There are good reasons for assigning these specimens to *erythræus*. Kossmann's description I have not seen, but from tracings of the figures there seems

to be agreement in the mandibular palp, the telson, and the 2nd gnathopod. The figure of the latter seems rather sketchy, but it is not unlikely that Kossmann overlooked the two conical teeth behind the squarish tooth near the hinge, as they are somewhat obscured by the spines and the long setæ. The locality is an additional reason. The length of Kossmann's species is given by Stebbing as about 6 mm.

Recorded Locality in Indian Ocean.—Red Sea.

Family Dexaminidæ.

Gen. *Polycheria* Hasw.

Stebbing, 1906, pp. 519, 735.

Polycheria atolli Wlkr.

Walker, 1904, p. 266, pl. 4, fig. 25 (non *antarctica* Stebb.).
,, 1905, p. 926, pl. 88, figs. 1–5, and 1909, p. 337.
Barnard, 1916, p. 211 (*antarctica* non Stebb.).
,, 1930, p. 390, fig. 49*d*.
Schellenberg, 1925, p. 157, fig. 15.

Occurrence :

St. B. Red Sea. 2 specimens 3·5 and 4·5 mm.

Remarks.—It seems certain that Walker's Ceylon specimens should be assigned to this species, and not to *antarctica*. Shoemaker (1935, p. 240) records *antarctica* from St. Thomas, W.I., without apparently distinguishing *atolli* and *antarctica*.

Recorded Localities in Indian Ocean.—Ceylon, Maldives, Seychelles, and British East Africa (Walker).

Distribution.—South Africa; New Zealand.

Family Talitridæ.

Gen. *Hyale* Rathke.

Stebbing, 1906, pp. 559, 735.
Barnard, 1916, p. 229.

Hyale nigra (Hasw.).

Stebbing, 1906, p. 571.
Schellenberg, 1928, p. 659, fig. 204.

Occurrence :

St. Extra. South Arabian coast. 2 ♂♂ 5·5–6·5 mm., 2 ovig. ♀♀ 5–5·5 mm., 4 juv. 2·5–3·5 mm.

St. MB II A. South Arabian coast. 1 ♂ 6 mm.

Remarks.—These specimens are larger than previous records; Suez Canal 4–5 mm. (Schellenberg), Australia 5 mm. (Haswell). The palp of the maxilliped is robust, and has no long apical seta, thus differing from the Mediterranean *camptonyx*. The lobe on distal end of 2nd joint of 2nd gnathopod is feebly crenulate. Otherwise as in Schellenberg's description.

Recorded Locality in Indian Ocean.—Suez Canal (Schellenberg).
Distribution.—Port Jackson, Australia (Haswell).

Family Aoridæ.

Gen. *Lembos* Bate.

Stebbing, 1906, pp. 594, 737.
Barnard, 1916, p. 237.

Lembos podoceroides Wlkr.

Walker, 1904, p. 279, pl. 6, fig. 39 ; 1905, p. 929 ; and 1909, p. 338.

Occurrence :

St. 27. Gulf of Aden. 1 ovig. ♀ 6 mm. (mutilated), 1 immat. 4 mm.

St. MB II C. South Arabian coast. 1 immat. ♂ 6 mm.

St. 45. South Arabian coast. 175 ♂♂ ♀♀ (some ovig.) and juv. 3–7 (or 8) mm.

Remarks.—No epistomial spine ; no ventral spines on the sterna. The present specimens show a characteristic grey speckling on the back of the pleon, sometimes also a small black medio-dorsal dot on peræon segment 7, or segments 6 and 7.

Walker (1904, p. 280) has remarked on the striking resemblance of the hand of 1st gnathopod of the adult ♂ to that of the 2nd gnathopod of *Jassa falcata* ; but the resemblance in a *fully* adult ♂, such as is present in the John Murray collection, is even more striking than Walker's figure shows it to be, because the 6th joint is more elongate, with the front and hind margins subparallel, the latter being thus concave. Another curious resemblance between the 1st gnathopod ♂ of one species and the 2nd gnathopod of another species is found in *Lembos chelatus* Wlkr. (1904, p. 280, pl. 6, fig. 40) and *Audulla chelifera* Chevr. (1901, p. 432, figs. 56–65). Walker and Scott (1903, p. 226) are certainly correct in placing the latter genus in the *Photidæ* rather than in the *Jassidæ*.

Walker's comparison of his species with *websterii* (see Sars, 1894, pl. 194) is not justified as regards the 3rd uropods ; in *websterii* the rami are not much longer than the peduncle, whereas in *podoceroides* they are twice (or almost) as long as the peduncle.

The rami much longer than the peduncle in uropod 3, combined with the presence of a spiniform process on *both* the 5th and 6th joints in 1st gnathopod ♂, are the features on which Pearse instituted the genus *Lembopsis* (1912). The utility of this genus may be questioned. There is a notable resemblance between the *sixth* joint of 1st gnathopod ♂ of the Mexican *Lembopsis spinicarpus* Pearse and that of the not quite fully adult ♂ of the present species, but the absence of a spiniform process on the 5th joint at once distinguishes the latter.

Recorded Localities in Indian Ocean.—Ceylon, Maldives, Red Sea (Walker).

Family Photidæ.

Gen. *Photis* Kröyer.

Stebbing, 1906, pp. 605, 738.
Barnard, 1932, p. 223.

Photis longicaudata (Bate & Westw.).

Walker, 1904, p. 286, pl. 6, fig. 43, and 1909, p. 339.
Chevreux and Fage, 1925, p. 310, fig. 319.
Schellenberg, 1928, p. 662.
(*Non* Barnard, 1916 = *uncinata* Brnrd. 1932.)
(*Non* Chilton, 1921 and 1925 = *digitata* Brnrd. 1935.)
(? Chilton, Phillipp. J. Sci., xvii, p. 513, 1920.)

Occurrence :

St. MB II C. South Arabian coast. 3 ♂♂, 1 ♀ 3·5–4 mm.

St. 45. South Arabian coast. 1 ♂ 2·3 mm., 1 ♀ 3 mm., 2 juv. 2 mm.

Recorded Localities in Indian Ocean.—Ceylon, Seychelles, British East Africa (Walker) ; Suez Canal (Schellenberg).

Distribution.—N. Atlantic and Mediterranean.

Photis dolichommata Stebb.

Stebbing, 1910, p. 609, pl. 55B.
Barnard, 1916, p. 247.

Occurrence :

St. 53. South Arabian coast. 1 ♀ 5 mm. (somewhat mutilated).

Remarks.—*P. lamellifera* Schell., 1928, from Zanzibar may perhaps prove synonymous. The elongate setæ on 6th joint of peræopod 5 are shown in Stebbing's figure of *dolichommata* and are found in the South African specimens and the present one. On the other hand, the lobed 5th joint in peræopods 3 and 4 is not conspicuous in South African ♂♂.

Distribution.—New South Wales; South Africa.

Gen. *Eurystheus* Bate.

Stebbing, 1906, pp. 610, 738.
Barnard, 1932, p. 224.

Eurystheus atlanticus (Stebb.).

Walker, 1904, p. 282, pl. 6, fig. 41 (*zeylanicus*).
,, 1905, p. 929, pl. 88, figs. 11–14, 16, 17 (*gardineri*).
,, 1909, p. 339 (*zeylanicus*) and footnote.
Stebbing, 1908, p. 86, pl. 14B.

Occurrence :

St. 10. Red Sea. 1 ♂ 5 mm., 4 ♀♀ 4·5–5 mm., 2 ovig. ♀♀ 6·5 mm.

Anchorage. South Arabian coast, 27.x.33. 10 ♂♂ 3–4 mm.

St. MB II A. South Arabian coast. 2 ♂♂ 5·5–6 mm.

St. 45. South Arabian coast. 7 ♂♂ 4–5 mm., 2 ♀♀ 5–6 mm.

Remarks.—The ♂♂ collected at the surface by hand-net at Anchorage are smaller than the others, and the inner ramus of 3rd uropod has an apical spinule only.

Recorded Localities in Indian Ocean.—Ceylon, Maldives, Seychelles (Walker).

Distribution.—Cape Verde Is. ; South Africa.

Eurystheus imminens Brnrd. (Text-fig. 11.)

Barnard, 1916, p. 250, pl. 28, fig. 12.

Occurrence :

St. 10. Red Sea. 1 ♂ 4·5 mm.

Remarks.—This specimen best fits the South African species, but seems to have a more fully developed 2nd gnathopod, although the animal is smaller in size. Both outer and inner anterior margins of 2nd joint of 2nd gnathopod end below in short triangular points, the latter more prominent (more easily observed) than the former; inner anterior margin with numerous very long simple setæ (as in the type). The 1st gnathopod fits

Text-fig. 11.—*Eurystheus imminens* Brnrd. Side-plate 2 and gnathopod 2, ♂, outer surface.

over, and externally to these setæ, into the hollowed antero-external surface of 2nd joint of 2nd gnathopod. The lower margin of 6th joint of 2nd gnathopod has fewer indents, with tufts of setæ, than in the type, and the palmar tooth nearest the hinge is squarer.

Although found together with *atlanticus*, this ♂ is recorded under the name *imminens*, and a figure is given to serve as a basis for future students to decide whether the latter name should be sunk as a synonym of *atlanticus*. The distinction in the palms of 2nd gnathopod of the two forms is this: in *atlanticus* the middle tooth is larger than that nearer the finger-hinge, but *vice versa* in *imminens*.

Distribution.—Natal coast, 27 fathoms.

Eurystheus afer (Stebb.). (Text-fig. 12.)

Barnard, 1916, p. 249, pl. 28, fig. 11.
Schellenberg, 1928, p. 662.

Occurrence :

St. 105. Zanzibar area. 2 ♂♂ 7·5 mm., 1 ♀ in dead *Balanus* shell, 9 mm.

St. 110. Zanzibar area. 1 ovig. ♀ 9·5 mm.

Recorded Localities in Indian Ocean.—Gulf of Suez and Bagamoyo (Schellenberg).
Distribution.—South Africa.

Text-fig. 12.—*Eurystheus afer* (Stebb.). Gnathopod 2, ♂, outer surface.

Eurystheus lophomeria n. sp. (Text-fig. 13.)

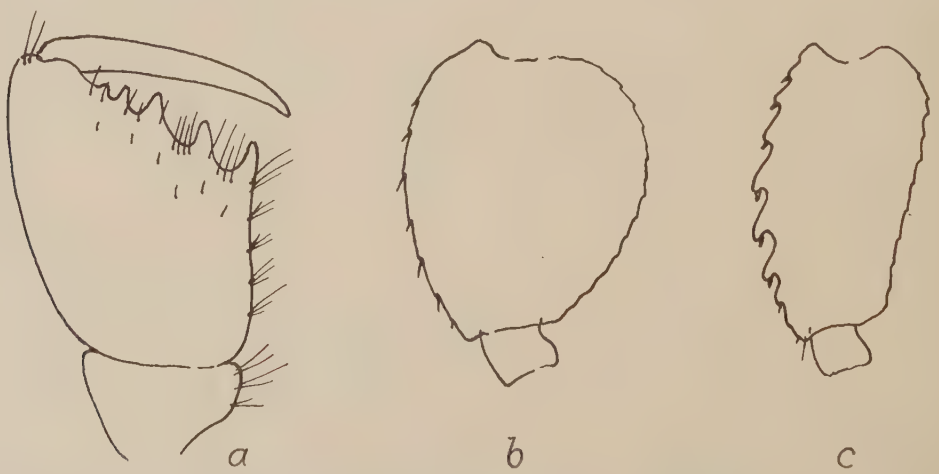
Occurrence :

St. 53. South Arabian coast. 1 ♂ 4 mm.

Description.—Ocular lobes moderately produced, subacute. Eyes rather large, oval. Side-plates rather shallow, entire. Postero-inferior angle of pleon segment 3 quadrate, with a short point; hind margin convex above the indent (cf. *thomsoni* Stebb., 1888, pl. 115). Pleon segment 4 dorsally with 3 teeth, segment 5 with 2 teeth (cf. *dentatus* Chevr., 1900, pl. 12), with a seta in the angle of each tooth.

Epistome with prominent spiniform process. Antennæ missing.

Gnathopod 1 normal. Gnathopod 2, 2nd joint channelled in front, but neither inner nor outer edge with a prominent distal lobe, 6th joint widening to the slightly oblique



Text-fig. 13.—*Eurystheus lophomeria* n. sp. *a*, Hand of gnathopod 2. *b*, 2nd joint of peræopod 3. *c*, 2nd joint of peræopod 5.

palm, which has 2 small teeth near hinge, then 2 larger ones, and a strong defining tooth, finger nearly straight.

Peræopod 3, 2nd joint broadly expanded, with spaced spinules on anterior margin, and feeble serrations on hind margin.

Peræopods 4 and 5 longer than peræopod 3, 2nd joint oblong, hind margin feebly serrate in both peræopods, anterior margin in peræopod 4 as in peræopod 3, but in peræopod 5 with a series of strong teeth, curving downwards, each bearing a spinule subapically.

Uropod 3 with well developed, subequal rami.

White with greyish speckling in places, eyes black.

Remarks.—Although the antennæ are missing, and the presence or absence of an accessory flagellum cannot be determined, the specimen has all the appearances of an *Eurystheus*. It seems to be allied to *dentatus* Chevr., 1900, and *semidentatus* Brnrd., 1916, but is distinguished by the more numerous palmar teeth in gnathopod 2, and the remarkable crest on front margin of 2nd joint (femur) of peræopod 5.

Gen. *Cheiriphotis* Wlkr.

Walker, 1904, p. 283.
Pirlot, 1934, p. 230.

Remarks.—I would suggest that the Australian *C. australis* Stebb. (1910, p. 611, pl. 54) is the same animal as that described by Haswell (1880, 'Proc. Linn. Soc. N.S.W.', iv, p. 332, pl. 20, fig. 4) as *Mœra dentifera*, which Stebbing (1906) transferred to the genus *Eurystheus*.

Cheiriphotis megacheles (Giles). (Text-fig. 14.)

Giles, 1885, p. 70, pl. 3 (*Melita m.* = ♂).
,, 1887, p. 227, pl. 8 (*Eurystheus hirsutus* = ♀).
Walker, 1904, p. 284, pl. 6, fig. 42.
Stebbing, 1910*a*, p. 461, and 1918, p. 68, pl. 12 (*walkeri*).
Barnard, 1916, p. 247 (*durbanensis*).
Schellenberg, 1926, p. 381.
Pirlot, 1934, p. 231, fig. 100 (*delloyei*).

Occurrence :

St. 53. South Arabian coast. 1 ♂ (not fully adult) 3·5 mm., 1 ovig. ♀ 5 mm.

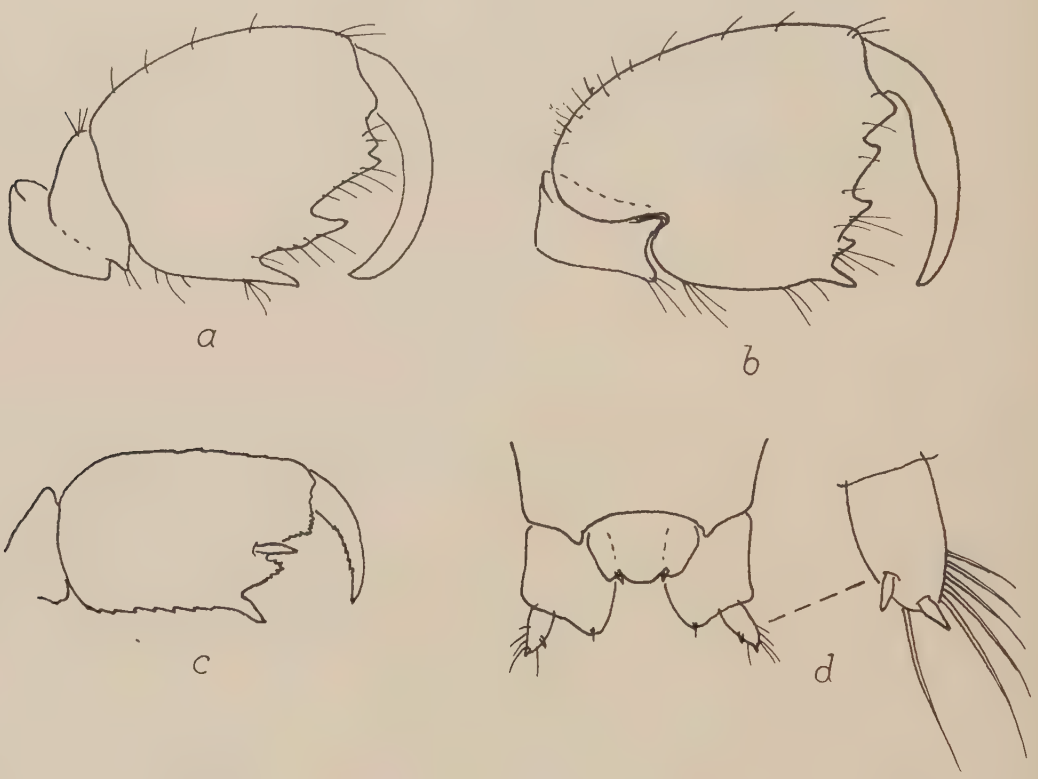
Remarks.—As regards *walkeri* Stebb., 1918, from Natal, I think there can be no doubt that it is synonymous with the Indian *megacheles*, which Stebbing (1910*a*) and Schellenberg (1926) have already recorded from South Africa. In addition to the indent in the palm of gnathopod 1, mentioned by Stebbing, there is a slight difference in the 1st peræopod, which in *walkeri* is more slender than in Walker's figure of that of *megacheles* (Stebbing's figure of gnathopod 1 is also more slender than that given by Walker).

In comparing *durbanensis* and the present specimen with Walker's and Stebbing's figures, we find that the 2nd joint of peræopod 1 is stout (only twice as long as wide) and not (or scarcely) curved (as in Stebbing's figure of *australis*). The hand of gnathopod 2 in the present specimen is obviously comparable with Walker's figure, and that of

durbanensis would seem to be an immature form, in which the 4th and 5th joints are only partly fused. When a large series of ♂♂ is available, comprising all growth-stages, I feel sure that *durbanensis* will prove synonymous. As this species has not been figured, I take this opportunity of giving a figure of the 2nd gnathopod ♂ alongside that of the John Murray specimen.

I feel constrained to make *delloyei* Pirlot also a synonym, if not of *megacheles*, at least of *durbanensis*.

Remarks on the Female.—In the present specimen the side-plates are very shallow, the 1st as figured by Walker, 1–4 setose. Gnathopod 2 very similar to Walker's figure.



Text-fig. 14.—*Cheiriphotis megacheles* (Giles). *a*, Hand of gnathopod 2, ♂ (type of *durbanensis* Brnrd.). *b*, Hand of gnathopod 2, ♂ (St. 53). *c*, Hand of gnathopod 2, ♀ (setæ omitted). *d*, Telson and 3rd uropods, ♀, with outer ramus of latter further enlarged.

Peræopods with numerous plumose setæ, especially on the 2nd–5th joints of peræopods 3–5. Uropod 3 without a trace on inner ramus, only a spinule on inner apex of peduncle.

The specimen seems to be the same as the ♀ described by Walker (1904), but as I have not seen Giles' description and figure of *hirsutus* (only Stebbing's 1906 description) I can express no opinion about the latter species. Walker seems to have had no doubt that *hirsutus* was the ♀ of *megacheles*, although in 1909 (p. 341) he says *E. monuropus* Wlkr. is distinct because Giles made no mention of the *inequality* of the rami of uropod 3. If Giles' *hirsutus* really had short but equal rami on uropod 3 there would be reason to doubt whether it should be regarded as the ♀ of *megacheles*.

E. monuropus Wlkr. (1909, p. 340, pl. 43, fig. 8) from Seychelles, British East Africa and Red Sea, has so many points of resemblance to Walker's 1904 ♀♀ of *megacheles* and to

the present specimen (shallow side-plates, etc.) that it should undoubtedly be transferred to the genus *Cheiriphotis*; and it would not be surprising if future study shows it to be synonymous with *megacheles*.

Recorded Localities in Indian Ocean.—Bay of Bengal (Giles); Ceylon (Walker).

Distribution.—South Africa; East Indies, 794 metres (*delloyei* Pirlot).

Gen. *Chevalia* Wlkr.

Walker, 1904, p. 288.
Pearse, 1912 (Proc. U.S. Nat. Mus. xliii), p. 374.

Remarks.—*C. mexicana* Pearse is very closely allied to the genotype, but is described as having side-plates 1 and 2 rounded below, instead of pointed.

Chevalia aviculæ Wlkr. (Text-fig. 15.)

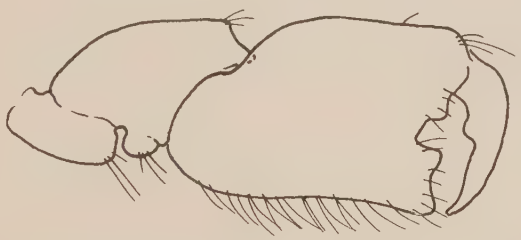
Walker, 1904, p. 288, pls. 7, 8, fig. 50, and 1909, p. 341.
Barnard, 1916, p. 252.

Occurrence:

St. 10. Red Sea. 3 ♀♀ (2 ovig.) 3–4 mm.

St. 45. South Arabian coast. 1 ♂ 4 mm., 1 ovig. ♀ 4·5 mm.

Remarks.—Flagellum of antenna 1 8-jointed, of antenna 2 6-jointed. Outer rami or uropods 1 and 2 shorter than the acutely-pointed inner rami, tipped in uropod 1 with 2–3, in uropod 2 with 3–4 spinules; opposing margins of the rami in uropod 1 finely



Text-fig. 15.—*Chevalia aviculæ* Wlkr. Distal joints of gnathopod 2, ♂.

setulose or ctenate. Gnathopod 2 has the hand more highly developed than in Walker's specimens or the South African ones; 6th joint with a deep notch in the transverse palm, the defining angle of which is rounded-quadrate; finger with a small projection on inner margin opposite the palmar notch. The hand of gnathopod 2 ♀ is similar to that of ♂, but the palmar notch and dactylar projection are much less pronounced. The branchiæ in both sexes, and the brood-lamellæ in ♀, are elongate and narrow, the latter setose on the margins (see Pearse, *l. c.*, fig. 5).

Recorded Localities in Indian Ocean.—Ceylon, Seychelles (Walker).

Distribution.—South Africa.

Family Ampithoidæ.

Gen. *Ampithoë* Leach.

Stebbing, 1906, pp. 631, 738.

Ampithoë ramondi (Aud.).

Kossmann, 1880, p. 134, pl. 14, figs. 12, 13 (*erythræa*).
Chevreux, 1901, p. 418 (*vaillanti*).
Walker, 1904, p. 291 (*vaillanti*), and 290, pl. 7, fig. 46 (*intermedia*).
,, 1905, p. 391 (*intermedia*).
,, 1909, p. 341 (*intermedia*), and p. 342, pl. 43, fig. 9 (*lobata*).
Barnard, 1916, p. 253 (*vaillanti*).
Chevreux & Fage, 1925, p. 333, figs. 341, 342 (*vaillanti*).
Schellenberg, 1928, p. 665.
Barnard, 1935, p. 305.

Occurrence :

St. Extra. South Arabian coast. 2 ♂♂ 4·5 mm., 1 ovig. ♀ 5 mm.

Remarks.—There is little reason to doubt that *lobata* is synonymous. The lobes on 2nd (and 3rd) joints of the gnathopods are not characteristic, and the tertiary cutting-edge on the mandible, *in the position figured by Walker*, is merely the new mandible developing within the old. Giles (1888, p. 242, pl. 10, fig. 2) describes and figures a triple cutting-edge in *A. inda* M. Edw., based probably on erroneous observation (*cf.* Sars, 1894, pl. 206).

The position of Milne Edwards' species is uncertain, though Giles' specimens seem referable to the present species. Giles' figures show no lobes on 2nd joints of the gnathopods.

Recorded Localities in Indian Ocean.—Red Sea (Kossmann, Spandl) ; Ceylon, Maldives, Wasin, Zanzibar (Walker) ; Suez and Suez Canal (Walker, Schellenberg) ; Seychelles (Walker, Chevreux) ; Dar-es-Salaam (Schellenberg) ; Tuticorin Pearl Banks (Barnard).

Distribution.—Atlantic to Azores, Mediterranean ; South Africa ; Southern Pacific.

Ampithoë falsa Brnrd. (Text-fig. 16.)

Barnard, 1916, p. 255, pl. 28, fig. 34 (*brevipes* non Dana).
,, 1932, p. 240.

Occurrence :

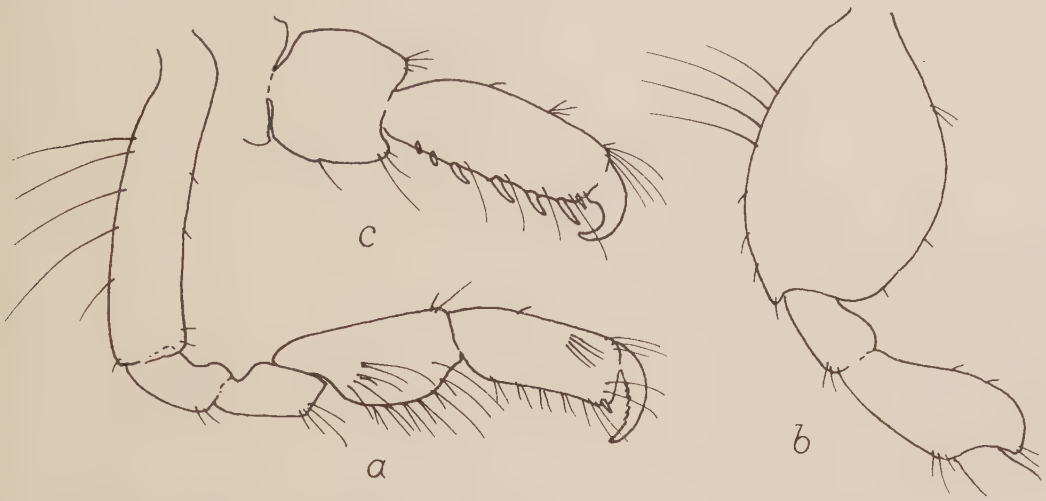
St. 22. Central Arabian Sea. 1 juv. 4 mm.

St. 31. Gulf of Aden. 1 ♂ 8 mm., 1 ♀ with embryos 7·5 mm.

Remarks.—Resembling the South African specimens in all respects. The 4th and 5th joints of peræopods 3 and 4 are very stout, the 5th joint of peræopod 3 being as broad as long.

There is a most deceptive resemblance between this species and *alluaudi* Chevr. (1901, p. 418, figs. 40–45) from the Seychelles ; but a detailed examination shows a number of differences. Both species have the same stout peræopods 3 and 4, a similar hand in gnathopod 2 ♂ (much heavier in the larger specimens of *falsa*), and comparatively slender mandibular palp. The 2nd joints of peræopods 1 and 2 are described as being strongly

dilated in *alluaudi* but no figure is given ; and the small habitus figure leaves one a little uncertain whether the 4th joints of these peræopods are as strongly lobed as in *falsa*. The mandibular palp in *falsa* is not cylindrical, but flattened ; when viewed edge-on it resembles Chevreux's figure ; when viewed at right angles, however, the joints are seen to be a little broader (as in Sars' figure of *Pleonexes*, 1894, pl. 207), the 3rd joint not quite as long as the 2nd (as in Chevreux's figure).



Text-fig. 16.—*Ampithoë falsa* Brnrd. *a*, Gnathopod 1. *b*, Proximal joints of peræopod 1. *c*, Distal joints of peræopod 3.

The outstanding differences are : the absence in *falsa* of a lobe at distal anterior end of 2nd joints of gnathopods 1 and 2 (both sexes), the rectangular shape of 6th joint of gnathopod 1 with its transverse palm (both sexes), and the shape and armature of 6th joint of peræopod 3. Gnathopod 2 in ♀ also has the hand rectangular, with transverse palm.

Chevreux remarks on the intermediate position *alluaudi* occupies between the genera *Ampithoë* and *Pleonexes*. The only real similarity to the latter genus seems to lie in the mandibular palp.

Distribution.—False Bay, South Africa.

Gen. *Grubia* Czern.

Stebbing, 1906, pp. 644, 738.
Barnard, 1916, p. 257 (references), and add Chevreux, 1907, p. 517 *Grubia filosa* (Sav.).

Grubia filosa (Sav.).

Walker & Scott, 1903, p. 226, pl. 14b, fig. 3*a–e* (*longicornis* non Kossm.).
Schellenberg, 1928, p. 666, fig. 206 (references and synonymy).
Shoemaker, 1935, p. 245, figs. 4, 5.

Occurrence :

St. MB II A. South Arabian coast. 2 ♀♀ 17–18 mm., 1 ovig. ♀ 15 mm.

Remarks.—Eyes without dark pigment. The body and peduncles of the antennæ of the ovigerous ♀ retain traces of a pale mauve coloration.

Recorded Localities in Indian Ocean.—Egypt or Red Sea (Savigny) ; Abd-el-Kuri (Walker & Scott) ; Suez and Dar-es-Salaam (Schellenberg).

Distribution.—If, as Schellenberg says, the identity of the several forms is accepted, the species ranges from the east coast of North America, through the Mediterranean and Indian Ocean to Australia. West Indies (Shoemaker).

Gen. *Sunamphitoë* Bate.

Stebbing, 1906, p. 645.

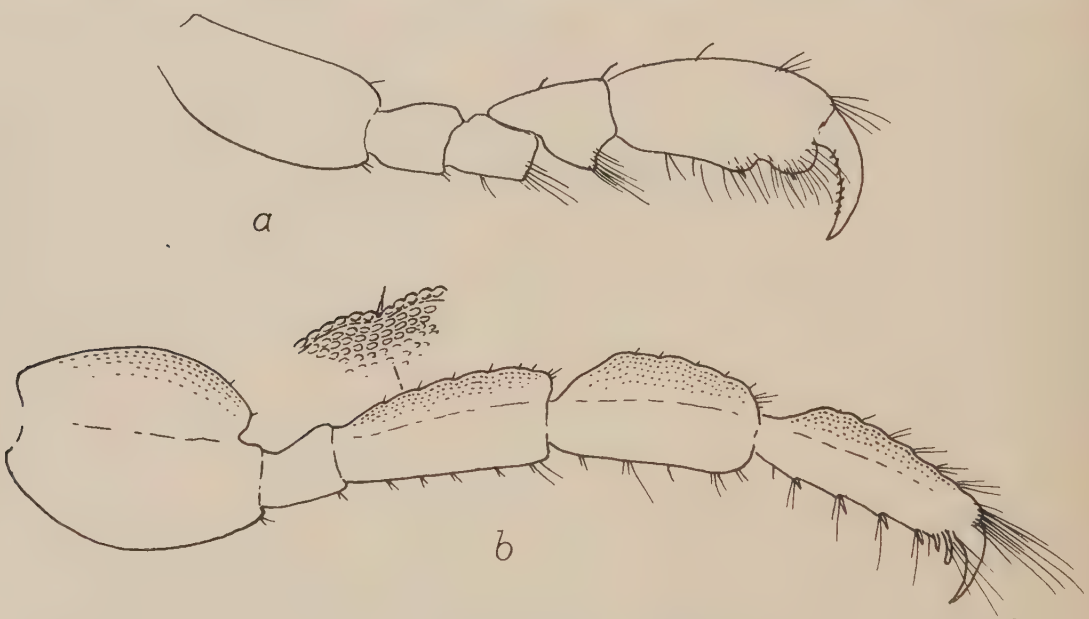
Sunamphitoë orientalis (Dana). (Text-fig. 17.)

Bate, 1862 (Cat. Amph. Brit. Mus.), p. 246, pl. 42, fig. 9 (copy after Dana).
Chevreux, 1900, p. 104.
Stebbing, 1906, p. 641 (*Ampithoë orientalis, species obscura*).

Occurrence :

St. 41. South Arabian coast. 1 ♂ 12 mm.

Remarks.—Chevreux is certainly correct in regarding Dana's species as a *Sunamphitoë*. But whether it is conspecific with *pelagica* is uncertain. I have assigned the present specimen to Dana's species for geographical reasons. Bate's description (from Dana) makes no mention of the 2nd joints of peræopods 4 and 5. The broadly expanded shape



Text-fig. 17.—*Sunamphitoë orientalis* (Dana). *a*, Gnathopod 2, ♂. *b*, Peræopod 5, with surface sculpturing further enlarged.

of this joint in these peræopods, as well as the enlarged and oar-like joints of the 5th peræopod, are features of the present specimen which apparently separate it from the well-known Atlantic *pelagica*.

In gnathopod 1 the 5th joint (measured along anterior margin) is almost as long as the 6th joint. In gnathopod 2 the 5th joint is triangular, as figured for the ♀ *pelagica* by Sars (1894, pl. 208) and by Chevreux & Fage (1925, fig. 348) ; and the 6th is not quite

so robust, appearing as if it required another ecdysis to bring it to the shape figured by these authors. Peræopods 4 and 5, 2nd joint broadly expanded, 4th and 5th joints in peræopod 4 slightly widened, 4th–6th joints in peræopod 5 more strongly expanded; peræopod 4 extending to just beyond end of 5th joint of peræopod 5. Antenna 2 very stout, flagellum subequal to last peduncular joint, 5–6-jointed, 1st joint elongate.

A similar oar-like expansion of peræopod 5 occurs in the South African *Macropisthopous stebbingi* Brnrd.; the latter, however, has a mandibular palp.

Distribution.—Philippine Islands.

Family Corophiidæ.

Gen. *Ericthonius* M. Edw.

Stebbing, 1906, pp. 670, 740.

Ericthonius brasiliensis (Dana).

Chevreux, 1901, p. 437 (*E. abditis* non Templeton).
Walker, 1904, p. 292 (*E. abditus* non Templeton).
,, 1909, p. 343.
Schellenberg, 1928, p. 668.
Shoemaker, 1935, p. 249.

Occurrence:

St. B. Red Sea. 1 ♂ 3·3 mm.
St. Extra. South Arabian coast. 2 ♂♂ 3 mm.
St. 45. South Arabian coast. 2 ♂♂ 2·3–2·5 mm.
St. 53. South Arabian coast. 1 ♂ 3 mm.

Recorded Localities in Indian Ocean.—Ceylon, Zanzibar (Walker); Seychelles (Walker, Chevreux); Suez (Walker, Schellenberg).

Distribution.—Cosmopolitan.

Gen. *Cerapus* Say.

Stebbing, 1906, pp. 665, 740.

Cerapus abditus Templeton.

Giles, 1885, p. 54, pl. 1 (♂) (*calamicola*).
Stebbing, 1888, p. 1163, pl. 125 (♀) (*flindersi*).
,, 1910, p. 616, pl. 55A (references).
Walker & Scott, 1903, p. 229, pl. 14B, fig. 6 (*flindersi*).
Walker, 1904, p. 293 (*calamicola*).
Barnard, 1916, p. 271.

Occurrence:

St. MB II C. South. Arabian coast. A lot, juv., ♀♀ and ♂♂, up to 8 mm., and a large number of tubes.
St. 45. South. Arabian coast. 1 ♂ 7 mm., with tube.
St. 53. South. Arabian coast. 1 ♀ 3·5 mm.

Remarks.—In ♂♂ 5 mm. in length there is a subsidiary denticle on the inner side of the large tooth forming the lower apex of 5th joint of gnathopod 2, and another tooth near the junction hinge of the 6th joint; the latter joint has a denticle in the middle of its

lower margin (*cf.* Stebbing, 1910, fig.). In ♂♂ 6 mm. in length there is a wider gap between the subsidiary denticle and the hinge tooth, and the denticle on the 6th joint has disappeared. In the largest ♂♂, 7·5–8 mm. in length, the hand is very robust, the subsidiary denticle is still present, but the rest of the distal margin forms an unbroken concavity to the junction with the 6th joint, without any hinge-tooth ; the 6th joint is slender, strongly curved, and without denticle.

Colour whitish, mottled with grey.

The tubes are covered with minute fragments of shell, sand-grains and Foraminifera, and measure up to 40 mm. in length.

Recorded Localities in Indian Ocean.—Bay of Bengal (Giles), Ceylon (Walker), Socotra (Walker & Scott).

Distribution.—Australia ; South Africa. Originally (1836) described from Mauritius, as seems probable from Templeton's description ('Trans. Entomol. Soc. London', vol. i, pt. 3, p. 190) of how he observed the animal alive.

Gen. *Siphonœcetes* Kröyer.

Stebbing, 1906, pp. 681, 740, and 1910, p. 618.

Siphonœcetes orientalis Wlkr.

Walker, 1904, p. 294, pl. 7, fig. 49.
Barnard, 1916, p. 270.

Occurrence :

St. MB II C. South Arabian coast. 1 specimen 4 mm.

Remarks.—Both pairs of antennæ missing. Resembling the South African specimens. Telson with shallow apical notch, on either side of which is a narrow transverse band of spinules. Peduncle of uropod 1 with numerous spinules along whole of inner and outer margins ; outer margin of outer ramus and inner margin of inner ramus with numerous spinules, the former also rough with minute scabrosities ; outer margin of inner ramus with close-set serrations. Armature of uropod 2 similar but weaker, with fewer spinules and no scabrosities on outer ramus. The apical lamina at end of peduncle of both uropods is very feebly developed, finely ciliate.

Recorded Locality in Indian Ocean.—Ceylon (Walker).

Distribution.—South Africa.

Family Podoceridæ.

Gen. *Podocerus* Leach.

Stebbing, 1906, pp. 700, 741, and 1910, p. 622.
Barnard, 1916, p. 276, and 1925, p. 366.
Chevreux, 1925 (Bull. Soc. zool. Fr. 50), p. 395.
Chilton, 1926 (Trans. New Zeal. Inst. lii), p. 513.

Remarks.—The following species have been recorded from the Indian region : *andamanensis* (Giles) 1890, *lævis* (Hasw.), *synaptochir* (Wlkr.) 1904, *zeylanicus* (Wlkr.) 1904, *brasiliensis* (Dana). The placing of *synaptochir* as a synonym of *brasiliensis* (Barnard),

1925, p. 366) is accepted by Schellenberg (1928, p. 674). It seems to me that probably *andamanensis* will share the same fate ; but *zeylanicus* appears to be valid.

On this basis the following synopsis is given, including the two species added by the John Murray Expedition :

1. Body carinate, with more or less well-developed dorsal processes. Peræopods 1 and 2 with 2nd joint linear . . . . . *palinuri.*
2. Body dorsally rounded, without processes :—
   a. Peræopods 1 and 2, 2nd joint linear, narrow :
      i. Peræopods 3–5, 6th joint strongly spinose . . . . . *brasiliensis.*
      ii. Peræopods 3–5, 6th joint feebly spinose . . . . . *lævis.*
   b. Peræopods 1 and 2, 2nd joint expanded on distal front margin :
      i. Peræopods 3–5, 6th joint feebly spinose. Gnathopod 2 ♂ 4th joint not produced, anterior margin with groups of spinules . . . *zeylanicus.*
      ii. Peræopods 3–5, 6th joint almost unarmed. Gnathopod 2 ♂ 4th joint sharply produced, anterior margin without spinules . . . *africanus.*

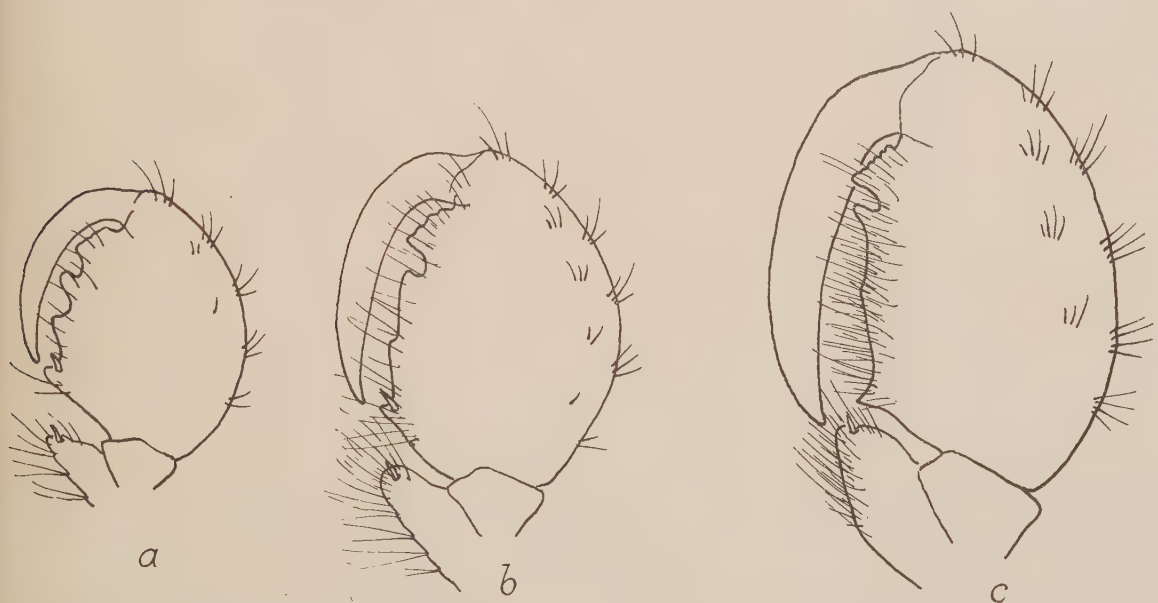
Podocerus palinuri Brnrd. (Text-fig. 18.)

Barnard, 1916, p. 277, pl. 28, fig. 23.

Occurrence :

St. 45. South Arabian coast. 4 specimens 3, 4·5, 5 and 5·5 mm.

Remarks.—These specimens agree with the Cape specimens, except that the 1st side-plate is not so acute, but that is a feature also of young specimens from the Cape.



Text-fig. 18.—*Podocerus palinuri* Brnrd. Growth-changes in hand of gnathopod 2, ♂. *a*, *b*, From specimens 4·5 and 5·5 mm. in length respectively (St. 45). *c*, From type-specimens 7–11 mm. (S. Africa).

Figures are given of the hand of gnathopod 2 ♂ in two of the present specimens, and also of the adult ♂ from the Cape, as the latter has not yet been figured. The hands of gnathopod 2 of the 5-mm. specimen are very setose. The 6th joint of peræopods 1–5 has strong spines on inner margin and groups of weaker spines on outer margin. The two

larger specimens are speckled with grey ; but the smallest one is speckled with pale maroon on the body (including ventral surface) and legs, while the head and hand of gnathopod 2 are uniform white.

There is a very close resemblance between *danæ* (Stebb.), *cristatus* (G. M. Thoms.), *hystrix* Stebb. and the present species as regards the development of crests and tooth-like processes on the body, and it may be possible to regard one or another of them as synonyms when more abundant material from several sources is available.

In the present species there is a gradual development of the dorsal crests, which are far more prominent in the adult ♂ than in the ♀. In fact a ♀ *palinuri* appears very like a ♂ *cristatus*, because the crests are developed only on the posterior half of the body.

Distribution.—South Africa.

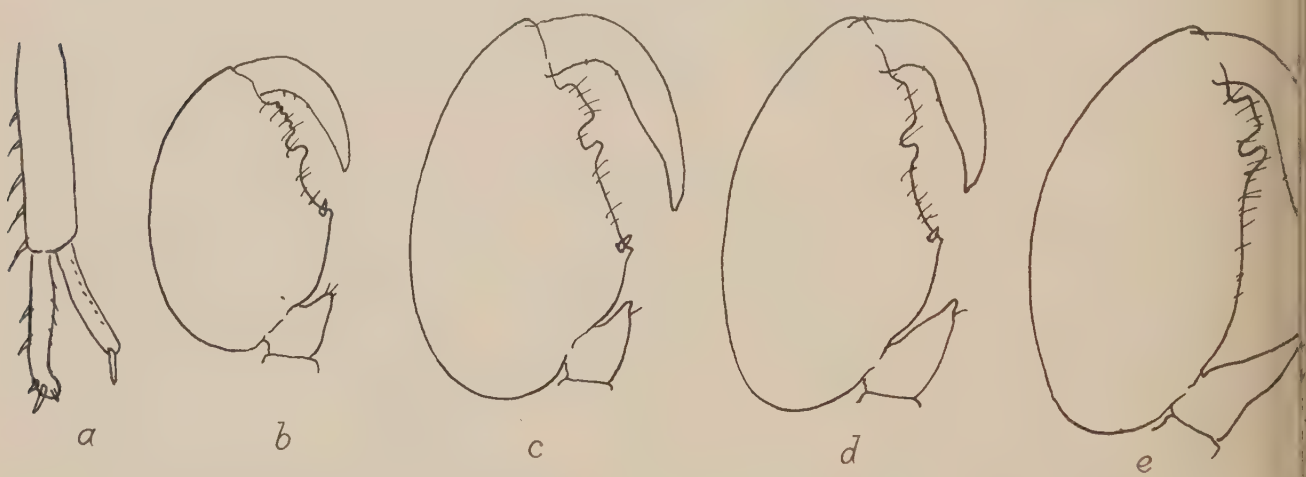
Podocerus africanus Brnrd. (Text-fig. 19.)

Barnard, 1916, p. 278, pl. 28, figs. 24, 25, and 1925, p. 367.

Occurrence :

St. Extra. South Arabian coast. A lot ♂♂, ♀♀ (ovig.) and juv. (adults 5–6 mm.).

Remarks.—Adult and nearly adult ♂♂ with a dense fringe of setæ on lower margins of 4th and 5th peduncular joints of 2nd antennæ (sometimes also on first flagellar joint).



Text-fig. 19.—*Podocerus africanus* Brnrd. *a*, Uropod 1 of adult ♂. Growth-changes in hand of gnathopod 2, ♂. *b*, From specimen 3·5 mm. in length; 2nd antennæ not furry. *c*, *d*, *e*, From specimens 4, 5 and 6 mm. respectively; 2nd antennæ furry.

A feature not noticed in the original description, but present in the South African as well as the present specimens, is the knob-like expansion of the apex of the inner ramus of uropod 1 in the adult (or nearly adult) ♂. Figures are given of the growth-changes in the 2nd gnathopod ♂. The lower margin of the hand is not so setose in the present specimens as in some of the Buffels Bay specimens (Barnard, 1916), and no specimen is as highly developed as the Natal ♂ specimen (Barnard, 1925), in which the upper and lower margins are parallel, the latter being thus concave.

Inner and outer margins of 6th joint of peræopods 1–5 with very few feeble spinules (usually one in middle of outer margin, and 2–3 along inner margin).

Even in juveniles 1·5 mm. in length the 5th joint of gnathopod 1 is as long as the 6th joint, thus forming a clear distinction between the ♂ of this species and that of

mangarevæ Chevr. (1907, p. 521, figs. 33–35). The ♀♀ of the two species, however, are very much alike; both have the rounded lobe-like projection of the 4th joint of gnathopod 2, but (as in the ♂♂) they are distinguished by the basal joints of the peræopods.

Distribution.—South Africa.

Gen. *Lætmatophilus* Bruz.

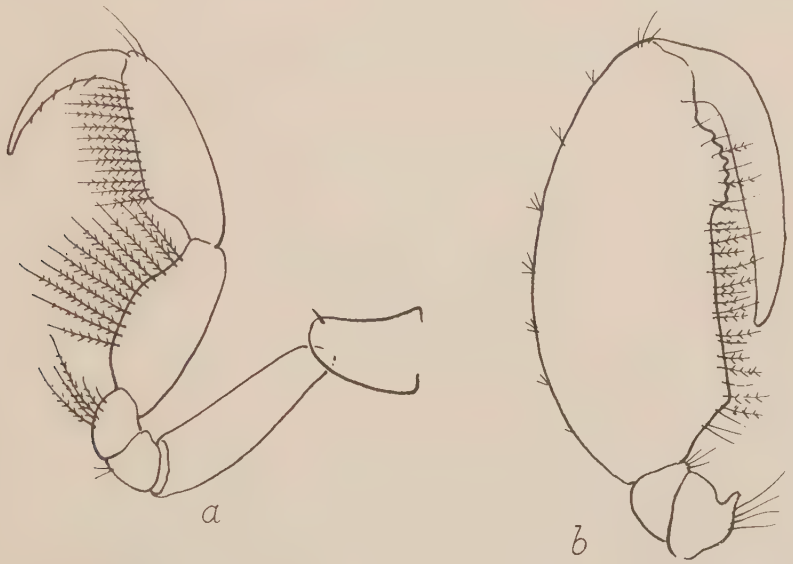
Stebbing, 1906, p. 695.
Barnard, 1916, p. 274.

Lætmatophilus leptocheir n. sp. (Text-fig. 20.)

Occurrence:

St. 45. South Arabian coast. 1 ♂ 4·5 mm.

Description.—Head and 1st peræon segment without dorsal keels. Peræon segment 2 to pleon segment 2 each with a medio-dorsal keel, which on peræon segment 2 is low



Text-fig. 20.—*Lætmatophilus leptocheir* n. sp. *a*, Gnathopod 1, ♂. *b*, Hand of gnathopod 2, ♂.

and rounded, and extends nearly the whole length of the segment, but on the following segments is limited to the posterior half of each segment and becomes tooth-like, acute and directed backwards. On these same segments a dorso-lateral tooth, obscure on peræon segment 2, but becoming more prominent and spiniform posteriorly. Lower margins of peræon segments 2–7 forming keels, projecting over bases of side-plates, those on segments 2, 3 and 4 subhorizontal, the anterior corners produced in short acute points, the hind corners quadrate, those on segments 5–7 projecting horizontally, anterior corners rounded, hind corners acute. Side-plate 1 narrowing below to a rounded apex, side-plates 2–7 subquadrate, with rounded corners, 6 and 7 ending below in a small backwardly directed point. Pleon segment 3 without dorsal armature. Postero-inferior angles of pleon segments 1–3 rounded.

Antenna 1: 1st joint stout, rest slender, 2nd and 3rd subequal or the latter slightly

shorter; 1st flagellar joint $\frac{2}{3}$ length of 3rd joint of peduncle, 2nd joint about $\frac{1}{3}$ the 1st, 3rd and 4th joints minute. Antenna 2 missing.

Gnathopod 1: 6th joint subequal in length to 5th, but slightly narrower, with plumose setæ on inner margin, but without any row of spines near the feeble palmar angle; finger slender.

Gnathopod 2; 2nd joint channelled in front, both edges ending distally in acute lobes; 4th joint with short spiniform projection; 6th elongate, palm long and straight, palmar angle obtuse, a raised crenulate ridge near finger-hinge; whole palm densely clothed with plumose setæ, finger not quite reaching palmar angle.

Uropod 1, peduncle subequal to outer ramus, which is $\frac{2}{3}$ length of inner ramus.

Whitish, speckled with grey.

Remarks.—More strongly cristate than any of the three South African species (Barnard, 1916), but less so than the Australian *hystrix* (Hasw.). The slender hand of gnathopod 1 resembles that of *durbanensis* Brnrd.

HYPERIIDEA.

Family Lanceolidæ.

Gen. *Lanceola* Say.

Barnard, 1932, p. 253.

Lanceola sayana Bov.

Walker, 1909*a*, p. 53.
Pirlot, 1930, p. 2.
Barnard, 1932, p. 254.

Occurrence:

St. 61. (Day.) Northern Arabian Sea. 1 specimen 8 mm.
St. 94. Central Arabian Sea. 1 specimen 14 mm.
St. 96. Central Arabian Sea. 2 specimens 13 and 16 mm.

Recorded Locality in Indian Ocean.—Seychelles (Walker).

Distribution.—Atlantic 56° N. 32½° S.; Indo-Pacific.

Family Mimonectidæ.

Stephensen & Pirlot 1931, p. 503.
Barnard, 1932, p. 252.

The former paper had not reached me when the "Discovery" Report was published. Some of my remarks are no longer tenable.

Gen. *Mimonectes* Bov.

Woltereck, 1904 (June) (Zool. Anz. xxvii), pp. 621, 629 (*Sphæromimonectes*).
Stebbing, 1904 (November) (Tr. Linn. Soc. London, x), p. 20 (*Parascina*).
Barnard, 1930, p. 395 (*Parascina*).
Stephensen & Pirlot, 1931, pp. 503, 552.

Mimonectes chevreuxi (Pirlot).

Stephensen, 1918, p. 17, figs. 5, 6 (*Parascina fowleri*, non Stebbing).
Pirlot, 1929, p. 56 (*Parascina chevreusi* [*sic*]), and 1930, p. 7.
Stephensen & Pirlot, 1931, p. 528, figs. I 4, II 5, and XI.
Barnard, 1932, p. 253.

Occurrence :

St. 172. Central Arabian Sea. 1 juv. 6 mm.

Remarks.—Stephensen & Pirlot (1931, pp. 506, 530) are almost certain that this form represents the ♂ of *M. loveni* Bov. (*l. c.* 1931, p. 507, figs. I 1, 2, II 1–3, III, IV). With the exception of one specimen captured by the Siboga Expedition in the East Indies, it has not been captured outside the Atlantic region.

In the present specimen the 4th and 5th joints of peræopod 3 (5) and the 5th joint of peræopod 5 (7) are more prominently expanded and oar-like than in Stephensen's figure. The 2nd antennæ are minute, consisting of a short basal joint and a narrower 2nd joint.

Distribution.—*chevreuxi :* Atlantic (Iceland to Madeira and Azores), East Indies (3° 20′ S. 127° 22′ E.).

loveni : Atlantic (Greenland to Gulf of Guinea, Barbados).

Family Scinidæ.

Stephensen & Pirlot, 1931, p. 551.

Gen. *Proscina* Steph. Pirlot.

Stephensen & Pirlot, 1931, p. 543.
Pirlot, 1932 (Ann. Inst. oceanogr. n.s. xii, fasc. 1), p. 23.

Proscina stephenseni (Pirlot). (Text-fig. 21).

Pirlot, 1929, p. 58, fig. 4 (♀) (*Parascina s.*).
Stephensen & Pirlot, 1931, p. 544, fig. xvii (mxp. & prp. 2, ♀).
? *Id., ibid.*, p. 545, fig. xvii (*magna* ♂).

Occurrence :

St. 131 (day, 1500 m.). Southern Arabian Sea. 1 ♂ about 6 mm.

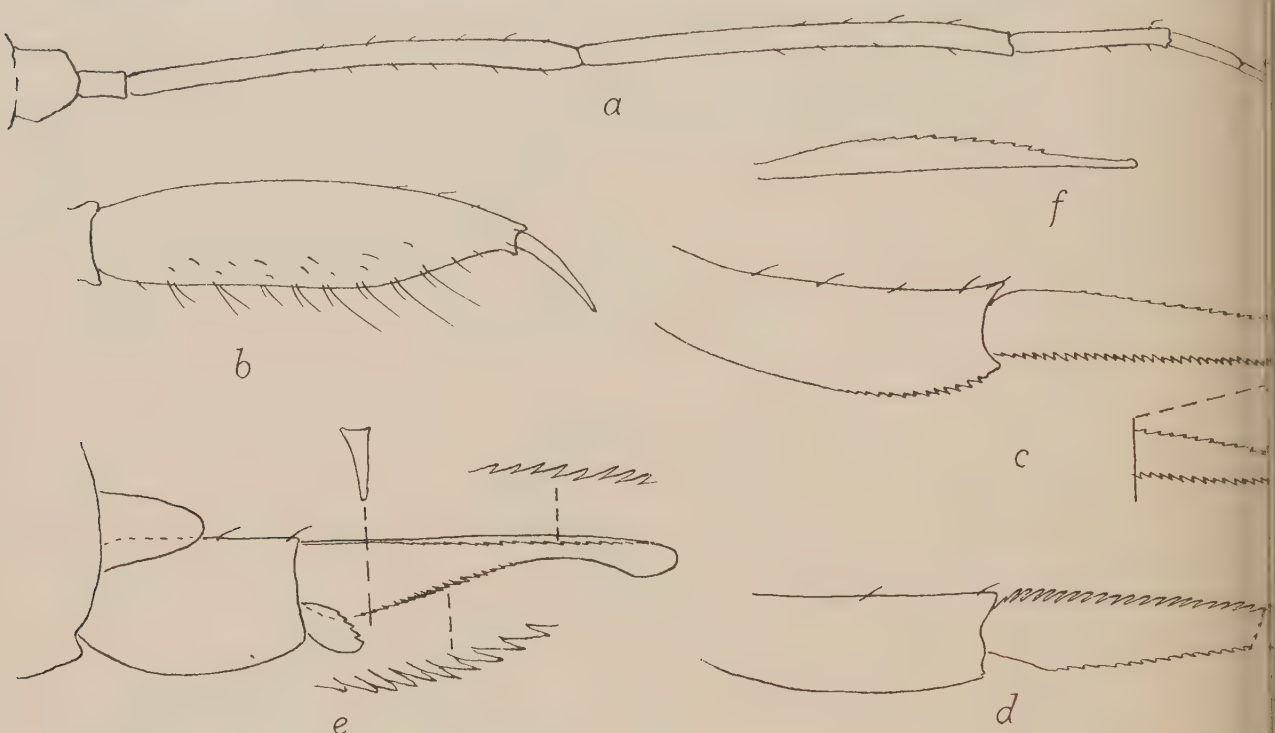
Description.—First antennæ as long as, or a little longer than peræon (3 mm.); flagellar joint very stout, triquetral, without any minute apical joints; the apex subacute and apparently uninjured, a thick brush of long setæ on the inner surface ; owing to the closely aggregated bases of these setæ the inner margin appears by transmitted light as a dark opaque stripe, while the outer part of the joint is transparent ; outer margin entire and glabrous. Second antennæ as long as the first antennæ, very slender, consisting apparently of a bulbous basal joint, followed by a short joint, then an elongate joint extending about $\frac{1}{3}$ along the flagellar joint of 1st antenna, then another elongate joint extending about $\frac{2}{3}$ along 1st antenna, and a flagellum of 3 or 4 joints, of which the 1st is the longest.

Gnathopod 1 as figured by Pirlot, with brush of setæ on anterior distal margin of 6th joint. Gnathopod 2 not more slender than gnathopod 1, as figured by Stephensen

& Pirlot. Peræopods 1–5 slender, as figured by Pirlot; peræopod 4 not longer than peræopod 3 and scarcely more slender than peræopod 5.

Pleopods large and robust; outer margins of peduncles more convex than in Stephensen's figure of *P. fowleri* (1918, fig. 5).

Uropod 1, peduncle serrate on outer distal margin; ramus (only one present) longer than peduncle, strongly serrate on both margins as far as the subacute apex. Uropod 2, peduncle apparently smooth on both margins; ramus (only one present, incomplete) similar to that of uropod 1. Uropod 3, peduncle stout, both margins smooth; outer ramus very small, ovate, serrate on its inner distal margin; inner ramus elongate, triquetral in



Text-fig. 21.—*Proscina stephenseni* (Pirlot). *a*, Antenna 2. *b*, Apical joints of gnathopod 2. *c*, Uropod 1. *d*, Uropod 2. *e*, Telson and uropod 3, with cross-section of inner ramus of latter. *f*, Inner view of inner ramus of uropod 3.

cross-section, the inner side straight and capable of fitting closely against its fellow, the inner lower margin smooth, inner upper margin serrate, outer margin sinuous; narrowing as far as the distal third, then swelling out in a slightly spatulate shape, serrate except in the distal third. Telson about $\frac{1}{2}$ length of peduncle of uropod 3, longer than broad, apex rounded.

Remarks.—This very interesting specimen is delicate, but in fair condition, barring the mutilation of the uropods and mouth-parts. It is the *third specimen* of this genus to be captured. There is little doubt that it is a ♂, in view of the length of the 2nd antennæ. The shape of the 3rd uropods may also prove to be a sexual character.

The specimen agrees with *stephenseni*, but has the 2nd gnathopod and 3rd uropod of *magna*. As, moreover, *stephenseni* was described from a ♀, and *magna* from a ♂, the presumption is not unreasonable that eventually *magna* will prove to be synonymous.

Distribution.—47° N. 18° W. (*stephenseni*); 36° N. 28° 53′ W. (*magna*).

Gen. *Scina* Prest.

Wagler, 1926 (revision and key to species).

Scina crassicornis (Fabr.).

Walker, 1909*a*, p. 52 (*cornigera*).
Stephensen, 1918, p. 19.
Wagler, 1926, p. 324, figs. 2, 3.
Barnard, 1932, p. 258.

Occurrence :

St. 96. Central Arabian Sea. 1 ♀ 11 mm.

St. 131 (night). Southern Arabian Sea. 1 specimen 7·5 mm.

Recorded Localities in Indian Ocean.—2° N.–32° S. (Bovallius, Stephensen) ; Seychelles (Walker) ; Indian Ocean between 29° S. and 2½° N., 89½°–76½° E. (Wagler).

Distribution.—Mediterranean, Atlantic, Indo-Pacific.

Scina curvidactyla Chevr.

Barnard, 1932, p. 259.

Occurrence :

St. 131. Southern Arabian Sea. 1 specimen 8 mm.

St. 172. Central Arabian Sea. 2 juv. 3·5 mm.

St. 186. Gulf of Aden. 1 ♀ 10 mm.

Recorded Localities in Indian Ocean.—Bay of Bengal, Chagos, and Seychelles (Wagler).

Distribution.—Atlantic, Mediterranean, Pacific.

Scina borealis (G. O. Sars).

Wagler, 1926, p. 337, figs. 9–11.
Barnard, 1930, p. 401, and 1932, p. 260.

Occurrence :

St. 186. Gulf of Aden. 23 specimens 4–5 mm.

Recorded Localities in Indian Ocean.—Bay of Bengal, Chagos and Seychelles, East African coast, Gulf of Aden (Wagler).

Distribution.—Atlantic, Mediterranean, Arctic and Antarctic, Southern Indian Ocean, Pacific.

Scina marginata Bov.

Wagler, 1926, p. 361, figs. 19–21.
Barnard, 1932, p. 261.

Occurrence :

St. 61 (night, 1136 metres wire out). Northern Arabian Sea. 1 ♂ 4·5 mm., 2 ♀♀ 4 and 5 mm.

Remarks.—The closely allied species *submarginata* Tattersall has been recorded from the Seychelles, Amirante and Cape Guardafui (Wagler).

Distribution.—Atlantic, Mediterranean.

Family Vibiliidæ.

Gen. *Vibilia* M. Edw.

Barnard, 1932, p. 262.

Vibilia propinqua Stebb.

Stephensen, 1918, p. 43, fig. 14.
Barnard, 1932, p. 263.

Occurrence :

St. 95. Central Arabian Sea. 5 ♀♀ 7·5–8 mm.

Recorded Localities in Indian Ocean.—7° N.–35° S. (Behning).

Distribution.—Atlantic, Mediterranean, Eastern Pacific.

Vibilia armata Bov.

Walker, 1909*a*, p. 53 (*gracilenta*).
Stephensen, 1918, p. 46, figs. 15, 16.
Pirlot, 1930, p. 11.
Barnard, 1931, p. 126, and 1932, p. 264.

Occurrence :

St. 61 (day, 1702 metres wire out). Northern Arabian Sea. 8 ♂♂, 13 ♀♀, 5–7·5 mm.

St. 61 (night, 1702 metres wire out). 13 ♂♂, 14 ♀♀, 5–7 mm.

St. 76 (800 metres wire out). Gulf of Oman. 2 ♂♂, 3 ♀♀, 6 mm.

St. 76 (1800 metres wire out). 1 ♂ 6 mm.

St. 96. Central Arabian Sea. 1 ♂ 6 mm., 2 ♀♀ (1 with embryos) 7 mm.

St. 145d (300–0 metres). Maldives. 1 ♀, with embryos, 5·5 mm.

Recorded Localities in Indian Ocean.—Seychelles (Walker), Indian Ocean (Behning).

Distribution.—Atlantic, Mediterranean, Australasia, East Indies, Eastern Pacific.

Vibilia pyripes Bov.

Stephensen, 1918, p. 52, fig. 17.
Barnard, 1932, p. 265.

Occurrence :

St. 61 (day, 566 metres wire out). Northern Arabian Sea. 4 ♂♂ 9–11 mm., 3 ♀♀ (1 with embryos).

St. 61 (day, 1136 metres wire out). 3 ♂♂ 9 mm.

St. 61 (day, 1702 metres wire out). 2 ♂♂ 10 mm.

St. 61 (night, 1136 metres wire out). 16 ♂♂ 9–11·5 mm.

St. 61 (night, 2265 metres wire out). 1 ♂ 11 mm.

St. 76. Gulf of Oman. 3 ♂♂ 9·5–10·5 mm.

Recorded Localities in Indian Ocean.—Near Equator (Behning).

Distribution.—Atlantic, Eastern Pacific.

Vibilia sp.

Occurrence :

St. 145c (50–0 metres). Maldives. 4 juv. 2 mm. in atrial cavity of a large Salp.

Family Paraphronimidæ.

Gen. *Paraphronima* Claus.

Spandl, 1927, p. 165 (key to species).

Paraphronima gracilis Claus.

Walker, 1909*a*, p. 52.
Spandl, 1927, p. 165, fig. 6.
Pirlot, 1930, p. 12.
Barnard, 1932, p. 267.

Occurrence :

St. 61 (night, 1136 metres wire out). Northern Arabian Sea. 3 ♂♂ 4·5–5 mm., 7 ♀♀ 5–6 mm.

Recorded Localities in Indian Ocean.—Chagos, Seychelles, Mauritius (Walker).

Distribution.—Mediterranean, Atlantic, Indo-Pacific.

Paraphronima crassipes Claus.

Bovallius, 1889, p. 33, pl. 2, figs. 16–40 (*clypeata*).
Spandl, 1927, p. 166.
Barnard, 1932, p. 267.

Occurrence :

St. 131. Southern Arabian Sea. 1 ♀ 13 mm. (length of head = depth of head, 3·5 mm.).

St. 172. Central Arabian Sea. 1 ♂ (penultimate instar) 9 mm.

St. 186. Gulf of Aden. 1 ♀ 11·5 mm.

Remarks.—This is the first record of this species in the Indian Ocean. Both these specimens agree with Bovallius' figures of the form *clypeata* in having stout 2nd joints to the peræopods, and stout uropods ; the rami of uropod 3 are not longer than the breadth of the peduncle.

Distribution.—Mediterranean, Atlantic, Pacific.

Family Hyperiidæ.

Bovallius, 1889, p. 74 (key to genera).
Spandl, 1927, p. 151 (key to genera).

Gen. *Hyperia* Latr.

Bovallius, 1889, p. 129 (key to species).
Spandl, 1927, p. 153.
Barnard, 1932, p. 273.

Hyperia promontorii Stebb.

Stebbing, 1888, p. 1385, pl. 166 B (♂), and p. 1391, pl. 168 (♀ *schizogeneios*).
Barnard, 1930, p. 411.
Pirlot, 1930, p. 16 (*schizogeneios*).

Occurrence :

St. 61 (night, surface). Northern Arabian Sea. 3 ♂♂ penult. instar 3 mm., 97 ♂♂ 3–3·5 mm., 20 ♀♀ (some ovig.) 2·5–3 mm.

Remarks.—As in the "Terra Nova" collection all the ♂♂ are *promontorii* (first 2 peræon segments fused), and all the ♀♀ are *schizogeneios* (first 3 peræon segments fused).

Distribution.—Atlantic 40° N.–45° S.; Mediterranean; East Indies; New Zealand.

Hyperia crucipes Bov.

Bovallius, 1889, p. 225, pl. 11, figs. 14–25.
Walker, 1904, p. 236.
Stephensen, 1924, p. 90.

Occurrence:

St. 76. Gulf of Oman. 4 juv. 1·3–2 mm.

St. 101. Central Arabian Sea. 1 ovig. ♀ 4 mm.

St. 172 (510 metres wire out). Central Arabian Sea. 1 ♀ 3 mm.

Remarks.—The identification of the juveniles should be taken with caution.

Recorded Locality in Indian Ocean.—Ceylon (Walker).

Distribution.—Tropical Atlantic.

Hyperia sp.

Occurrence:

St. 136. Maldives. 2 juv. 1–1·3 mm.

Gen. *Hyperioides* Chevr.

Chevreux, 1900, p. 143.
Vosseler, 1901, p. 56 (*Parahyperia*).
Stebbing, 1904, p. 34.

Hyperioides longipes Chevr.

Barnard, 1930, p. 414 (references), and 1932, p. 276 (references).

Occurrence:

St. 186. Gulf of Aden. 1 ♂ 5·3 mm.

Distribution.—Atlantic, Mediterranean, Northern New Zealand seas to 52° S.

Family Dairellidæ.

Barnard, 1932, p. 282.

Gen. *Dairella* Bov.

Barnard, 1932, p. 282.

Dairella latissima Bov.

Bovallius, 1889, p. 336, pl. 15, figs. 1–20.
Barnard, 1932, p. 282.

Occurrence:

St. 186. Gulf of Aden. 1 ♀ 4 mm.

Remarks.—The first record of this species in the Indian Ocean.

Distribution.—Atlantic, Mediterranean.

Family Phronimidæ.

Gen. *Phronima* Latr.

Barnard, 1932, p. 282.

Phronima sedentaria (Forsk.).

Walker, 1909*a*, p. 51.
Pirlot, 1930, p. 12.
Barnard, 1932, p. 283.

Occurrence :

St. 5. Red Sea. 1 ♀ 14 mm.
St. 7. Northern Arabian Sea. 1 ♀ 12 mm.
St. 61 (day, 2265 metres wire out). Northern Arabian Sea. 1 ♀ 15 mm.
St. 61 (night, 2265 metres wire out). 3 ♀♀ 12–15 mm.
St. 95. Central Arabian Sea. 1 ♂ 8·5 mm., 29 ♀♀ 15–24 mm., with houses.
St. 96. Central Arabian Sea. 3 ♂♂ 7·5–10·5 mm., 9 ♀♀ 11–22 mm., with houses.
St. 98. Central Arabian Sea. 2 ♀♀ 18 and 26 mm.
St. 108. Zanzibar area. 1 ♀ 26 mm.
St. 121. Zanzibar area. 2 ♀♀ 28 and 30 mm.
St. 131. Southern Arabian Sea. 2 ♀♀ 18 and 21 mm.
St. 172 (510 metres wire out). Central Arabian Sea. 1 ♀ 18 mm. in house, 4 ♀♀ 7, 10, 11, 13 mm., 2 juv. 2·5–3 mm.
St. 172 (2665 metres wire out). 1 ♀ 18 mm., 1 ♀ in house 16 mm.
St. 184. Gulf of Aden. 1 ♀ 17 mm.
St. 186 (880 metres wire out). Gulf of Aden. 1 ♀ 16 mm.
St. 186 (1500 metres wire out). 1 ♀ 17 mm.

Remarks.—In one of the houses from St. 95 there are two groups of juveniles, comprising 7 and 9 individuals, in the 3rd and 4th instars (6 of the 3rd and 1 of the 4th, and 7 of the 3rd and 2 of the 4th respectively). This seems to bear out the statements of Minkiewicz and Stephensen, but there is the possibility that some of the juveniles have been pressed out of the house in the process of capture and preservation.

Recorded Localities in Indian Ocean.—Chagos, Seychelles (Walker).

Distribution.—Mediterranean, Atlantic, Indo-Pacific (Borneo, Bate, 1862).

Phronima atlantica Guér.

Spandl, 1924, p. 24.
Stephensen, 1924, p. 121.
Pirlot, 1930, p. 14.
Barnard, 1932, p. 285.

Occurrence :

St. 61. Northern Arabian Sea. 1 ♀ 7 mm.

Recorded Localities in Indian Ocean.—28°–29° S. 96°–97½° E. (Stephensen); Red Sea (Spandl).

Distribution.—Mediterranean, Atlantic, Indo-Pacific, Antarctic.

Phronima atlantica var. *solitaria* Guér.

Stephensen, 1924, p. 125.

Occurrence :

St. 7. Red Sea. 14 ♀♀ 12–16 mm. with houses, 2 ovig. ♀♀ 13 and 14 mm.

St. 61. Northern Arabian Sea. 1 ♀ 10 mm.

Recorded Localities in Indian Ocean.—Without special locality (Bovallius).

Distribution.—Mediterranean, Atlantic, Indo-Pacific.

Phronima colletti Bov.

Bovallius, 1887 (Bih. K. Sv. Vet. Ak. Handl. xi), p. 25 (published not later than October*).
Giles, 1887 (*bucephala*) (published November 2nd*).
Stephensen, 1924, p. 127.
Pirlot, 1930, p. 14.
Barnard, 1932, p. 286.

Occurrence :

St. 61 (night, surface). Northern Arabian Sea. 97 ♂♂ ult. instar 6–6·5 mm.

St. 61 (night, 1136 metres wire out). 21 ♂♂ penult. and ult. instars 6–7 mm., 64 ♀♀ 6–8 mm.

St. 61 (night, 1702 metres wire out). 2 ♂♂ 5–6 mm., 10 ♀♀ 5–7 mm.

St. 186 (1150 metres wire out). Gulf of Aden. 1 ♀ 5·5 mm.

Recorded Localities in Indian Ocean.—Bay of Bengal (Giles), 22° 44′ S. 86° E. (Stephensen).

Distribution.—Mediterranean, Atlantic, Indo-Pacific.

Gen. *Phronimella* Claus.

Stephensen, 1924, p. 130.

Phronimella elongata (Claus).

Giles, 1887 (*Phronima hippocephala*).
Walker, 1909*a*, p. 51.
Stephensen, 1924, p. 130.
Pirlot, 1930, p. 15.
Barnard, 1932, p. 286.

Occurrence :

St. 61 (day, 1702 metres wire out). Northern Arabian Sea. 1 ♂ penult. instar 5 mm., 4 ♀♀ 8–9 mm.

St. 61 (night, surface). 23 ♂♂ ult. instar 6–7·5 mm.

St. 61 (night, 1136 metres wire out). 8 ♂♂ penult. and ult. instars 5–7 mm., 10 ♀♀ 5–11 mm.

St. 61 (night, 1702 metres wire out). 2 ♂♂ 6–6·5 mm., 5 ♀♀ 6–7 mm.

St. 131D. Southern Arabian Sea. 3 ♂♂ 5–6 mm., 1 ♀ 6 mm.

* Bovallius' paper was received at the British Museum (Nat. Hist.) library in October, whereas Giles' paper was published on November 2nd, according to information kindly supplied by Dr. C. D. Sherborn and Dr. Chopra respectively.

Recorded Localities in Indian Ocean.—Bay of Bengal (Giles); Ceylon to Mauritius to Seychelles (Walker); 27°–40° S. 53°–101° E. (Stephensen).

Distribution.—Mediterranean, Atlantic, Indo-Pacific, Antarctic.

Family Phrosinidæ.

Gen. *Phrosina* Risso.

Bovallius, 1889, p. 421.

Phrosina semilunata Risso.

Walker, 1904, p. 230, and 1909*a*, p. 52.
Spandl, 1924, p. 26.
Stephensen, 1924, p. 138.
Pirlot, 1930, p. 23.

Occurrence:

St. 61 (night, 1136 metres wire out). Northern Arabian Sea. 18 ♀♀ (some ovig.) 6·5–8 mm.
St. 61 (night, 1702 metres wire out). 14 ♀♀ (some ovig.) 6–8 mm.
St. 61 (night, 2265 metres wire out). 1 ♀ 8 mm.
St. 131 (day, 1500 metres). Southern Arabian Sea. 1 ovig. ♀ 13 mm.
St. 131 (night, 600 metres). 3 ♀♀ 11, 15, 16 mm., 2 ovig. ♀♀ 17 and 21 mm.
St. 172 (1500 metres wire out). Central Arabian Sea. 1 ovig. ♀ 15 mm.
St. 172 (2665 metres wire out). 1 ♀ 11 mm.

Recorded Localities in Indian Ocean.—Socotra to Ceylon (Walker); Chagos, Mauritius, Seychelles (Walker); 26°–40° S. 24°–72° E. (Stephensen); Red Sea (Spandl).

Distribution.—Mediterranean, Atlantic, Indo-Pacific, Antarctic.

Gen. *Primno* Guér.

Stebbing, 1904 (Trans. Linn. Soc. Lond. x), p. 38.

Primno macropa Guér.

Walker, 1909*a*, p. 52.
Spandl, 1924, p. 25.
Stephensen, 1924, p. 143.
Pirlot, 1930, p. 22 (*Euprimno macropus*).
Barnard, 1932, p. 287, pl. 1, fig. 8 (coloured).

Occurrence:

St. 131 (600 metres). Southern Arabian Sea. 2 mutilated specimens.
St. 131 (1500–0 metres). 1 ovig. ♀ 5 mm.
St. 172. Central Arabian Sea. 1 ♂ 6 mm., 5 ♀♀ 4·5–6·5 mm.

Recorded Localities in Indian Ocean.—Mauritius, Seychelles, Chagos (Walker); Red Sea (Spandl); 4°–38° S. 30°–71° E. (Stephensen).

Distribution.—Mediterranean, Atlantic, Indo-Pacific, Antarctic.

Gen. *Anchylomera* M. Edw.

Bovallius, 1889, p. 408.

Anchylomera blossevillei M. Edw.

Walker, 1904, p. 230, and 1909*a*, p. 52.
Spandl, 1924, p. 26.
Stephensen, 1924, p. 134.
Pirlot, 1930, p. 21.

Occurrence :

St. 61 (night, surface). Northern Arabian Sea. 3 ♂♂ penult. instar 4·5–5·5 mm., 16 ♂♂ ult. instar 6–6·5 mm., 83 ♀♀ (some ovig.) 4–6 mm., 21 juv. 2·5–4 mm.

St. 61 (night, 1136 metres wire out). 1 ♂ 7 mm., 2 ovig. ♀♀ 5–5·5 mm., 4 ♀♀ 3–4 mm.

St. 61 (night, 1702 metres wire out). 4 ♀♀ 4·5–5·5 mm.

Recorded Localities in Indian Ocean.—Socotra to Ceylon (Walker); Chagos, Cargados (Walker); 11°–38° S., 30°–103° E. (Stephensen); Red Sea (Spandl).

Distribution.—Mediterranean, Atlantic, Indo-Pacific.

Family Pronoidæ.

Gen. *Pronoë* Guér.

Stebbing, 1888, p. 1507.

Pronoë capito Guér.

Walker, 1909*a*, p. 54.
Spandl, 1924, p. 34, fig., and 1927, p. 217.

Occurrence :

St. 172. Central Arabian Sea. 1 ♂ 10·5 mm., 1 ♀ 10 mm.

Recorded Localities in Indian Ocean.—Zanzibar, Indian Ocean, Moluccas (Claus); Red Sea (Spandl); Chagos, Seychelles (Walker).

Distribution.—Mediterranean, N. Atlantic, Indian Ocean, S. Pacific.

Gen. *Eupronoë* Claus.

Spandl, 1927, p. 222.

Eupronoë maculata Claus.

Stephensen, 1925, p. 156, figs. 53, 54.
Pirlot, 1930, p. 33.
Barnard, 1932, p. 289.

Occurrence :

St. 61. Northern Arabian Sea. 1 ovig. ♀ 6 mm.

St. 186 (510 metres wire out). Gulf of Aden. 2 ♀♀, with embryos, 7 and 7·5 mm.

St. 186 (1150 metres wire out). 2 ♀♀, with embryos, 7·5 mm.

Recorded Localities in Indian Ocean.—Zanzibar (Claus); 8° N. 83° 52′ E. (Ceylon) (Stephensen).

Distribution.—Mediterranean, Atlantic, Indo-Pacific.

Eupronoë armata Claus.

Spandl, 1927, p. 224, fig. 42, and p. 222 (*intermedia*).
Barnard, 1930, p. 427.

Occurrence :

St. 145. Maldives. 2 ♀♀ 3·5–4 mm.

Recorded Locality in Indian Ocean.—Zanzibar (Claus).

Distribution.—Atlantic, Madagascar, East Indies.

Gen. *Parapronoë* Claus.

Barnard, 1932, p. 290.

Parapronoë crustulum Claus.

Walker, 1909*a*, p. 54.
Spandl, 1927, p. 220, fig. 39 (*stebbingi*), and p. 221, fig. 40.
Pirlot, 1930, p. 31.

Occurrence :

St. 120. Zanzibar area. 1 ovig. ♀ 23 mm.

St. 172 (510 metres wire out). Central Arabian Sea. 2 ♀♀ 12 and 14 mm.

St. 172 (820 metres wire out). 1 ♀ 11 mm.

St. 172 (2665 metres wire out). 1 ♀ 19 mm.

Remarks.—Lower margin of 5th joint of gnathopod 1 serrate or strongly serrate, the joint itself of the shape of that of *clausoides* Stebb. (1888, pl. 191). Anterior margin of 2nd joint of peræopod 4 smooth. Peræopod 5 with 2 minute terminal joints. Telson with margins evenly convex. Brick-red (rather faded in some specimens), the chromatophores deeper red, eyes dull maroon.

Recorded Localities in Indian Ocean.—Zanzibar (Claus) ; Seychelles (Walker).

Distribution.—Atlantic, Indo-Pacific.

Parapronoë clausoides Stebb.

Walker, 1909*a*, p. 54.
Barnard, 1932, p. 290, fig. 165.

Occurrence :

St. 172 (510 metres wire out). Central Arabian Sea. 3 ♀♀ 17–19 mm.

Remarks.—Lower margin of 5th joint of gnathopod 1 feebly serrulate. Anterior margin of 2nd joint of peræopod 4 strongly serrate distally.

Recorded Locality in Indian Ocean.—Seychelles (Walker).

Distribution.—Australia, Indian Ocean, Atlantic.

Gen. *Sympronoë* Stebb.

Stebbing, 1888, p. 1533.

Sympronoë parva (Claus).

Walker, 1904, p. 230, and 1909*a*, p. 54.
Spandl, 1927, p. 225, fig. 43.
Pirlot, 1930, p. 32.
Barnard, 1932, p. 291.

Occurrence :

St. 61 (1133 metres wire out). Northern Arabian Sea. 1 ♂ 6 mm.

St. 61 (1702 metres wire out). 2 ♀♀ 6 mm.

St. 186. Gulf of Aden. 1 ♂ 6 mm.

Recorded Localities in Indian Ocean.—Zanzibar (Claus); Socotra to Ceylon (Walker); Seychelles (Walker).

Distribution.—Mediterranean, Atlantic, Indo-Pacific.

Family Lycæidæ.

Gen. *Lycæa* Dana.

Barnard, 1930, p. 428 (provisional key to species).

Lycæa pulex Marion.

Giles, 1887, p. 220, pl. 5 (*Amphipronoë longicornuta*).
Walker, 1909*a*, p. 54 (*similis*).
Chevreux and Fage, 1925, p. 429, fig. 419 (♀).
Stephensen, 1925, p. 167.
Pirlot, 1930, p. 24.

Occurrence :

St. 61 (night, surface). Northern Arabian Sea. 12 ♂♂ penult. and ult. instars 3·5–4·5 mm., 15 ♀♀, some ovig. 3·75–4 mm.

Remarks.—Pirlot considers that not only *similis*, *longicornuta* and *bajensis*, but also *gracilis* (with a query), are synonymous with Marion's species. As regards *gracilis*, Spandl (1924) describes and figures the 6th joint of gnathopod 2 as tapering distally. Chevreux & Fage describe and figure the 6th joint of gnathopod 1 as having a strong tooth in distal third of the lower margin in ♀. In the present specimens the ♀♀ do not differ from the ♂♂ in this respect, the 6th joint in both gnathopods 1 and 2 having the normal shape, with feebly concave lower margin and quadrangular, more or less projecting, lower distal corner. I think there is no doubt that Giles' specimens and the present ones are the same species. A revision of the genus is desirable.

Recorded Localities in Indian Ocean.—Chagos (Walker, *similis*); Red Sea (Spandl); Bay of Bengal (Giles, *longicornuta*).

Distribution.—Subtropical and tropical Atlantic, Mediterranean, East Indies. (*L. bajensis* is recorded from California, New Zealand, and the Great Barrier Reef.)

Family Brachyscelidæ.

Gen. *Brachyscelus* Bate.

Stephensen, 1925, p. 172.

Brachyscelus globiceps Claus.

Stebbing, 1888, p. 1550, pl. 197, fig. B (*latipes*).
Stephensen, 1925, p. 176, fig. 65.
Barnard, 1932, p. 293 (reference to Stebbing wrongly quoted, also in Stephensen).

Occurrence :

St. 61 (night, surface). Northern Arabian Sea. 1 ♀ 6 mm., 1 ovig. ♀ 7 mm.

St. 61 (day, 1136 metres wire out). 2 ovig. ♀♀ 7 mm.

St. 172 (510 metres wire out). Central Arabian Sea. 1 ♂ 11 mm. (breadth of head 3 mm., of peræon 4 mm.). 1 ♀ with embryos 7 mm., 1 ♀ 5 mm.

St. 172 (820 metres wire out). 4 ♀♀ (1 ovig.) 6·5–7·5 mm.

St. 186 (1150 metres wire out). Gulf of Aden. 2 ♀♀ 6 mm.

Remarks.—Telson and uropods in ♂ agreeing with Stebbing's figure, though the telson is not quite so broadly rounded, in ♀ telson more like Stephensen's figure, but outer ramus of uropod 3 at least $\frac{4}{5}$ length of inner ramus. Second joint of peræopod 3 very broad in ♂, not so broad in ♀. Anterior margins of 2nd joints of peræopods 3 and 4 almost smooth. No conspicuous scale-markings on integument.

It is not definitely certain that these specimens belong to Claus' species (*cf.* also Stephensen and Barnard, *l. c.*), or even that the ♂ and ♀ are conspecific. An examination of a much larger amount of material is necessary before the limits of the species in this genus can be satisfactorily determined. (Boone, ' Bull. Vanderbilt Mus.' vi, p. 226, 1935, describes and figures *B. stebbingi* n. sp.)

Recorded Locality in Indian Ocean.—Zanzibar (Claus).

Distribution.—Mediterranean, S. Pacific.

Gen. *Thamneus* Bov.

Stebbing, 1888, p. 1558.
Barnard, 1932, p. 293.

Thamneus platyrhynchus Stebb.

Stebbing, 1888, p. 1558, pl. 198.
Walker, 1909*a*, p. 54.
Stephensen, 1925, p. 180, figs. 69, 70 (*Euthamneus p.*).
Barnard, 1932, p. 293.

Occurrence :

St. 61 (day, surface). Northern Arabian Sea. 1 ♂ 5 mm.

St. 101. Central Arabian Sea. 4 ♀♀ 3–6 mm.

Remarks.—Colour as preserved, pinkish, the whole dorsal surface with darker red stellate specks, eyes maroon.

Recorded Localities in Indian Ocean.—4° 48′ S. 67° 22′ E., and 9°–12° S. 60°–62° E. (Walker) ; 8° N. 83° 51′ E. (Stephensen).

Distribution.—Atlantic, Mediterranean, Cape of Good Hope, Pacific.

Family Oxycephalidæ.

Gen. *Simorhynchotus* Stebb.

Simorhynchotus antennarius (Claus).

Stebbing, 1888, p. 1572, pl. 200.
Stephensen, 1925, p. 185, fig. 72.
Barnard, 1930, p. 433, and 1931, p. 130.

Occurrence :

St. 61 (night, surface). Northen Arabian Sea. 8 ♂♂ 5–5·5 mm.

Recorded Localities in Indian Ocean.—Zanzibar (Claus), Bay of Bengal (Stephensen).

Distribution.—Atlantic, Mediterranean, Pacific.

Gen. *Oxycephalus* M. Edw.

Spandl, 1927, p. 179.
Cecchini, 1929, p. 5.

Oxycephalus clausi Bov.

Walker, 1909*a*, p. 55.
Stephensen, 1925, p. 188.
Cecchini, 1929, p. 5, pl. 1.
Barnard, 1932, p. 294.

Occurrence :

St. 96 (15 metres wire out). Central Arabian Sea. 10 juv. 6–9 mm.
St. 96 (914 metres wire out). 2 ♀♀ 15 and 22 mm.
St. 122. Zanzibar area. 1 ♀ 30 mm.
St. 131 (day, 2500 metres). Southern Arabian Sea. 1 ♀ 25 mm.
St. 172 (1500 metres wire out). Central Arabian Sea. 1 ♂ 19 mm.
St. 172 (2665 metres wire out). 1 ♂ 15 mm.

Recorded Localities in Indian Ocean.—Chagos, Seychelles (Walker); 3° N.–38° S., 24½°–111° E. (Stephensen); Red Sea (Cecchini).

Distribution.—Mediterranean, Atlantic, Indo-Pacific.

Gen. *Streetsia* Stebb.

Spandl, 1927, p. 184.

Streetsia challengeri Stebb.

Walker, 1909*a*, p. 55.
Stephensen, 1925, p. 194, fig. 75.
Barnard, 1930, p. 435, and 1932, p. 295.

Occurrence :

St. 61 (day, 1136 metres wire out). Northern Arabian Sea. 1 ♀ 16 mm.
St. 61 (day, 1702 metres wire out). 1 ♀, with embryos, 16 mm.
St. 61 (day, 2265 metres wire out). 1 ♀ 17 mm.
St. 61 (night, 1133 metres wire out). 1 ♂ and 3 ♀♀ (2 ovig.) 14 mm.
St. 61 (night, 1702 metres wire out). 1 ♂ 11·5 mm., 3 ♀♀ 10, 11, 14 mm.
St. 172 (820 metres wire out). Central Arabian Sea. 1 ♀ 11 mm.
St. 186. Gulf of Aden. 1 ♀ 17 mm.

Recorded Localities in Indian Ocean.—Chagos, Seychelles (Walker).

Distribution.—Mediterranean, Atlantic, Indo-Pacific.

Streetsia porcellus (Claus).

Stephensen, 1925, p. 192.
Spandl, 1927, p. 188, figs. 20, 21 (*intermedius*).
Barnard, 1932, p. 295.

Occurrence :

St. 61 (night, 1133 metres wire out). Northern Arabian Sea. 1 ♀ 9·5 mm.

St. 61 (night, 1702 metres wire out). 1 ♂ 10 mm., 1 ♀ 8·5 mm., 1 ♀, with embryos, 9·5 mm.

Recorded Locality in Indian Ocean.—Zanzibar (Claus).

Distribution.—Mediterranean, Atlantic, Indo-Pacific.

Gen. *Glossocephalus* Bov.

Bovallius, 1887 (Bih. K. Sv. Vet. Ak. Handl. xi), p. 35 (quoted from next reference).
,, 1890, p. 105.
Giles, 1888, p. 250 (*Elsia*).

Glossocephalus milne-edwardsi Bov.

Giles, 1888, p. 249, pl. 6, figs. 2–4 (♀) (*Elsia indica*).
Walker, 1904, p. 237, pl. 1, fig. 2 (♂♀) (*Elsia indica*).
Spandl, 1927, p. 196, fig. 24.
Cecchini, 1929, p. 9, pl. 4.
Barnard, 1932, p. 131.

Occurrence :

St. 39. Gulf of Aden. 1 ♂ 13 mm.

Recorded Localities in Indian Ocean.—Bay of Bengal (Giles); Ceylon (Walker); 7°–2° S. 80°–90° E. (Bovallius); Red Sea (Cecchini).

Distribution.—Mediterranean, Tropical Atlantic.

Gen. *Rhabdosoma* Ad. & White.

Spandl, 1927, p. 207.
Cecchini, 1929, p. 11.

Rhabdosoma whitei Bate.

Giles, 1887, p. 219, pl. 4 (*investigatoris*).
Walker, 1909*a*, p. 55.
Stephensen, 1925, p. 207.
Cecchini, 1929, p. 11, pl. 5.
Barnard, 1932, p. 296.

Occurrence :

St. 7. Red Sea. 2 ♀♀ and 1 ovig. ♀ *ca.* 40 mm.

St. 61 (day, 566 metres wire out). Northern Arabian Sea. 1 ♂ mutilated, 1 ♀ 23 mm.

St. 61 (night, 1702 metres wire out). 1 ♀, with embryos, *ca.* 45 mm.

St. 76. Gulf of Oman. 1 juv. ♂ 20 mm.

St. 186. Gulf of Aden. 1 ♂ 36 mm.

Recorded Localities in Indian Ocean.—Bay of Bengal (Giles); Seychelles (Walker); Southern Indian Ocean and East Indies (Stephensen); Red Sea (Cecchini).

Distribution.—Atlantic, Indo-Pacific.

Gen. *Leptocotis* Streets.

Stephensen, 1925, p. 191.
Barnard, 1930, p. 434.

Leptocotis tenuirostris (Claus).

Walker, 1909*a*, p. 55.
Stephensen, 1925, p. 191, fig. 74 (synonymy).
Barnard, 1930, p. 435 (synonymy), and 1932, p. 296.

Occurrence :

St. 61 (night, 1136 metres wire out). Northern Arabian Sea. 2 ♀♀ (1 ovig.), 9–10 mm.

St. 186 (1150 metres wire out). Gulf of Aden. 1 ♂ 9 mm.

Recorded Localities in Indian Ocean.—3° 31′ S. 72° 27′ E., 4° 48′ S. 67° 22′ E., Chagos, and Mauritius (Walker).

Distribution.—Atlantic; Gilolo, East Indies; Pacific, 29° N. 36° S.

Family Platyscelidæ.

Gen. *Platyscelus* Bate.

Spandl, 1927, p. 227.

Platyscelus ovoides (Claus).

Walker, 1909*a*, p. 54 (*Eutyphis o.*).
Stephensen, 1925, p. 213.
Spandl, 1927, p. 228, fig. 44.

Occurrence :

St. 108. Gulf of Aden. 1 ♀ with embryos 18 mm.

St. 119. Gulf of Aden. 2 ♀♀ 20 mm. (1 ovigerous and 1 with embryos 1·6 mm. in length).

St. 121. Gulf of Aden. 2 ♀♀ with embryos 17 mm.

Recorded Localities in Indian Ocean.—Seychelles (Walker), 27° 40′ S. 58° 30′ E. (Stephensen).

Distribution.—Mediterranean, Atlantic, Indo-Pacific.

Platyscelus armatus Stebb.

Walker, 1909*a*, p. 53.
Spandl, 1927, p. 229, fig. 45.

Occurrence :

St. 172. Central Arabian Sea. 1 ovig. ♀ 18 mm. (epimera not angularly projecting).

Recorded Locality in Indian Ocean.—Seychelles (Walker).

Distribution.—Warm seas (Spandl).

Platyscelus inermis (Claus).

Barnard, 1932, p. 298.

Occurrence :

St. 5. Red Sea. 1 ♀, with embryos, 11 mm.

Remarks.—See comments in the "Discovery" report. Lower margin of 6th joint of gnathopods 1 and 2 serrated for its entire length as in Stebbing's figures of *armatus* (1888, pl. 182), not merely at apex as in Spandl's figures of *armatus* (1927, p. 230, fig. 45).

Recorded Locality in Indian Ocean.—Mozambique (Claus).

Distribution.—Atlantic.

Gen. *Hemityphis* Claus.

Spandl, 1927, p. 233.

Hemityphis crustulum Claus.

Walker, 1909*a*, p. 53 (*crustulatus* typ. err.).
Spandl, 1927, p. 236, fig. 47.
Barnard, 1930, p. 37 (*rapax*, M. Edw.).

Occurrence :

St. 61 (night, 1133 metres wire out). Northern Arabian Sea. 1 ♂ 5 mm., 1 ♀, with embryos, 4·5 mm.

St. 61 (night, 1702 metres wire out). 5 ♀♀ (3 ovig.) 4–4·5 mm.

Remarks.—The 2nd joint of gnathopod 1 is expanded in the middle in ♀ (as in Spandl's figure), but in the ♂ is bottle-shaped, slender proximally, expanding distally.

Recorded Localities in Indian Ocean.—Zanzibar (Claus); Chagos, Seychelles (Walker).

Distribution.—Warm and temperate seas (if only the one species *rapax* be recognized). East Indies.

Gen. *Tetrathyrus* Claus.

Spandl, 1927, p. 240.
Barnard, 1930, p. 439.

Tetrathyrus forcipatus Claus.

Spandl, 1924, and 1927, p. 240, fig. 48.
Barnard, 1930, p. 439.
Pirlot, 1930, p. 42, fig. 11.

Occurrence :

St. 61. Northern Arabian Sea. 1 ♂ 6 mm.

Recorded Locality in Indian Ocean.—Red Sea (Spandl).

Distribution.—Mediterranean, Atlantic, East Indies.

Gen. *Paratyphis* Claus.

Barnard, 1930, p. 438.
Pirlot, 1930, p. 39 (key to species).

Paratyphis maculatus Claus.

Stephensen, 1925, p. 223, fig. 86.
Pirlot, 1930, p. 39.

Occurrence :

St. 186. Gulf of Aden. 1 ♂ 4·5 mm., 4 ♀♀ 3·5–4·5 mm., 1 ovig. ♀ 5·5 mm.

Remarks.—Resembles Spandl's figures of *maculatus*, but peræopod 5 is slender as in Stephensen's figure of *clausii*.

Distribution.—Atlantic, East Indies.

Paratyphis parvus Claus.

Barnard, 1930, p. 439.

Occurrence :

St. 172 (510 metres wire out). Central Arabian Sea. 1 ♀ 3·5 mm.

Remarks.—The process of 5th joint of gnathopod 2 is apically acute and serrate on its lower margin distally. Peræopod 5 narrow, without trace of apical rudimentary joint. Outer ramus of uropod $3\frac{2}{3}$ length of inner ramus.

Distribution.—Atlantic, New Zealand.

Gen. *Amphithyrus* Claus.

Barnard, 1930, p. 438.
Pirlot, 1930, p. 43.

Amphithyrus bispinosa Claus.

Stephensen, 1925, p. 225.
Spandl, 1927, p. 247, fig. 50.
Barnard, 1930, p. 438.

Occurrence :

St. 61 (night, surface). Northern Arabian Sea. 29 ♀♀ (some ovig.) 3–4 mm.

St. 172 (510 metres wire out). Central Arabian Sea. 1 ♂ 3 mm.

St. 186 (510 metres wire out). Gulf of Aden. 1 ♂ 3 mm.

Recorded Locality in Indian Ocean.—Bay of Bengal (Stephensen).

Distribution.—Atlantic, Mediterranean, East Indies, Pacific.

Amphithyrus sculpturatus Claus.

Claus, 1887, p. 41, pl. 7, figs. 1–9.
Stebbing, 1888, p. 1485, pl. 210, fig. B (*orientalis*).
Shoemaker, 1925 (Bull. Amer. Mus. Nat. Hist., lii), p. 58, figs. 25, 26 (*orientalis*).
Stephensen, 1925, p. 226.
Spandl, 1927, p. 250.

Occurrence :

St. 96. Central Arabian Sea. 1 ♀ 5 mm.

Remarks.—The last peræopod bears 2 rudimentary joints at the end of the 2nd joint, as in *inermis* (Spandl, p. 250, key to species), but the whole integument is strongly sculptured. As remarked under *glaber* (Barnard, 1930, p. 438), I do not think that a limb subject to reduction is a very reliable guide in differentiating species. The single specimen is therefore assigned to *sculpturatus*, of which *orientalis* seems to be a synonym.

Distribution.—*sculpturatus* : Atlantic and Mediterranean. *orientalis :* Pacific (Stebbing), Gulf of California (Shoemaker).

Family Thyropidæ.

Gen. *Thyropus* Dana.

Spandl, 1927, p. 258.

Thyropus sphæroma Claus.

Spandl, 1927, p. 259, figs. 53, 54, and p. 284, fig. 63.
Pirlot, 1930, p. 36.

Occurrence :

St. 61 (night, surface). Northern Arabian Sea. 19 ♂♂ 5–5·5 mm

St. 61 (night, 1702 metres wire out). 1 ♂ 4·5 mm.

Distribution.—Tropical Atlantic, East Indies.

CAPRELLIDEA.

Family Caprellidæ.

Gen. *Caprella* Lam.

Mayer, 1903, pp. 14, 72.

Caprella danilevskii Czern.

Barnard, 1916, p. 280.

Occurrence :

St. MB II A. South Arabian coast. 1 immature ♂ 8·5 mm., 1 juv. 5 mm.

Distribution.—Bay of Biscay, Mediterranean, Black Sea ; Bermuda ; Rio de Janeiro ; South Africa ; Port Jackson, Australia ; Japan.

Gen. *Paradeutella* Mayer.

Mayer, 1890, p. 29, and 1903, p. 45.
Schellenberg, 1928, p. 676.

Remarks.—The genus is entirely Indo-Pacific, comprising the following species : *echinata* (Hasw.), New South Wales, *bidentata* Mayer, Ceylon, *lævis* Mayer, *armata* Mayer, and *spinosa* Mayer, Singapore, *multispinosa* Schell., Suez, and *serrata* Mayer, South Africa.

Paradeutella bituberculata n. sp.

Occurrence :

St. 45. South Arabian coast. 1 ♂ 5 mm.

Description.—Head with one medio-dorsal upstanding, slightly forwards curving, spine ; posterior margins of peræon segments 1 and 2 each with a medio-dorsal conical tubercle, peræon segments 3 and 4 each with a low medio-dorsal tubercle on both anterior and posterior margins ; peræon segment 2 with a *pair* of subdorsal conical tubercles opposite the insertion of the 2nd gnathopods. A lateral spine above insertion of 2nd gnathopods and the gills on segments 3 and 4.

Peduncle of antenna 1 without tubercles or projections.

Gnathopod 2, 2nd joint with tooth on antero-exterior margin distally, a similar tooth

on 3rd joint, 4th subglobular below, 6th as in *echinata* (see Mayer, 1890, pl. 3, fig. 42), the defining angle not prominent, the squarish tooth (Gleithöcker) near the hinge bidentate. Gills ovate with slender peduncles. Rudiments of peræopods not traceable.

Remarks.—The paired tubercles on the 2nd peræon segment are distinctive, and although *armata* Mayer has a pair of spines on this segment, the other characters do not quite fit for this latter species.

Gen. *Monoliropus* Mayer.

Mayer, 1903, p. 53.

Monoliropus falcimanus Mayer.

Mayer, 1904, p. 225, fig. 1.

Occurrence :

St. 45. South Arabian coast. 2 ♂♂ 9·5 and 12 mm., 5 ♀♀ 8–10·5 mm., 2 ovig. ♀♀ 3·5 and 9 mm., 1 juv. ♀ 3 mm.

Remarks.—The rudiments of the peræopods at the bases of the gills on segments 3 and 4 are extraordinarily minute and difficult to detect. The difference in size of the two ovigerous ♀♀ is interesting, but not unusual in the *Caprellidæ*.

This species is very close to *agilis* from Siam, and may prove to be merely the adult of that species.

Recorded Locality in Indian Ocean.—Ceylon.

Gen. *Hemiægina* Mayer.

Mayer, 1890, p. 40, and 1903, p. 65.
Raj, 1927, p. 126.

Hemiægina ? minuta Mayer.

Mayer, 1890, p. 40, pl. 1, figs. 25–27 ; pl. 3, figs. 32–35 ; pl. 5, figs. 52, 53 ; pl. 6, figs. 13, 33, 34 ; pl. 7, fig. 4 ; and 1903, p. 65, pl. 6, fig. 72.

Occurrence :

St. Extra. South Arabian coast. 1 ♂ 4·5 mm.

Remarks.—Unfortunately the specimen has lost both 2nd gnathopods, so that it is impossible to say whether it belongs to the typical form or to the Ceylon form with a squarish notch on the palm, which Raj regards as a separate species (Raj, *l. c.*, p. 126, pl. 18, *quadripunctata*).

Recorded Locality in Indian Ocean.—Ceylon (Raj).

Distribution.—Amoy, 8–25 fathoms (Mayer) ; 1° 42′ S. 130° 47′ E., 32 metres (Mayer).

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